THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. VII. Nº 137—10th YEAR.] LONDON, JANUARY 19, 1858. [Subscription { 15s. in Advance / 18s. Credit. per Ann. } Price 8d. Unstamped.]

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FIRE-CLAY Retorts and Fire Goods.

The Advertiser has brought his Fire-Clay Retorts to great perfection, both as to quality and finish. Many have stood three and four years.

Every description of Fire Goods in any quantity always on hand. The Fire Clay is the very best in the North of England. Stock never less than 10,000 tons weathering.

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Apply, G. H. RAMSAY, of Derwenthaugh Fire-Brick Works, near NEWCASTLE-ON-TYNE.

Aug. 22, 1856.

TO IRON-FOUNDERS, GASHOLDER-MAKERS, &c.

THE St. Andrew's Gas Company intend to erect a CAST-IRON TANK 61 feet diameter and 14 feet deep. Also a GASHOLDER, to work in the same without counterpoise, 60 feet diameter and 14 feet deep. Crown, No. 14; Sides, No. 15, Wire-Gauge, with 8-inch Inlet and Outlet Pipes; Hydraulic Valves, Six Brackets, Guide-Rods, Guide-Wheels, and all matters necessary for the complete erection of the same in the most approved manner. The whole to be fitted up complete, gas and water tight, and in working order, by the end of July, 1858, at the Company's works, St. Andrew's, FIFE.

Competent parties willing to Contract for the Supply and Erection of the same are invited to send in Competing Plans and Specifications (free of expense) for the Tank and Gasholder, with separate Estimates for each, on or before the 8th of February, 1858.

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N.B. The Company do not bind themselves to accept the lowest or any Tender.

St. Andrew's, Jan. 5, 1858.

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Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE CLAY."

J. C. and Co. have been for many years the most extensive Manufacturers of Fire Clay Retorts in the United Kingdom; and orders for Fire Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their works as above.

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Coal and Coke Office,

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WANTED, a Manager, to proceed to Calcutta as Deputy Manager of that Station, but capable of undertaking (if required) the whole Management of the Works. The Salary will be an increasing one, and will commence at £400 per annum. A single man preferred.

Address by letter (prepaid) to the SECRETARY of the Oriental Gas Company (Limited), 127, LEADENHALL STREET, E.C.

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CRAWFORD PASSAGE, RAY STREET,

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WILLIAM COCHRAN CARR,

begs most respectfully to thank the Metropolitan, Provincial, and Continental Gas Companies for their patronage for several years past, and to intimate that he has rebuilt and enlarged his extensive premises for the Manufacture of CLAY RETORTS; and that he is now prepared to execute the largest orders with punctuality and despatch. Orders for FIRE-CLAY RETORTS, of all shapes and sizes, FIRE-BRICKS, and all other Articles in Fire-Clay, executed on the shortest notice, and on the most reasonable terms.

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Original Manufacturers of Wrought-Iron Gas Tubes, and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Steam Boilers.

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Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.

N.B. All Goods thoroughly Tested before sent out, and Warranted.

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MANUFACTURER OF PATENT WET AND DRY GAS-METERS,

AND GENERAL GAS APPARATUS AND FITTING WORKS,

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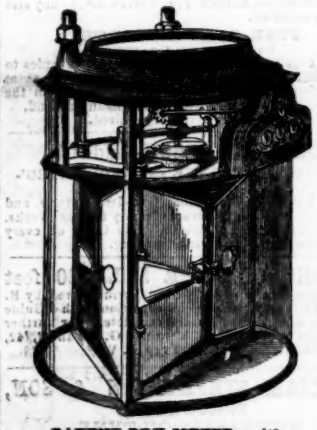
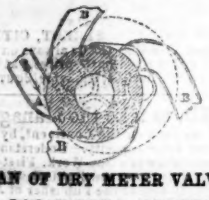
Station Meters, Experimental Meters, and Gasholders; Governors, Pressure Registers, By-pass and Slide-Valves, Photometers, &c.



PATENT DRY METER, with ECCENTRIC ROTARY VALVE.



PLAN OF DRY METER VALVE.

Important Notice.

THOMAS EDGE, from his long and intimate experience of Dry Meters, being aware of the great imperfections which exist in the valves of all those hitherto in use (whether made by himself or other manufacturers), notwithstanding their extensive use by several Gas Companies, has the pleasure to announce that he is at length enabled to introduce to their notice a Meter (invented by Mr. Hyams), with a Valve the peculiar movement of which must commend itself to every scientific man as not liable to become defective.

It is well known that the Valvular Surfaces of all Dry Meters hitherto made, whether slide or rotary, very soon become separated, and allow a portion of the gas to pass through unregistered. The reason of this is, that by the erroneous principle upon which these valves are constructed every particle of deposit from the gas is constantly carried along the same path without ever being removed, and thus a gradual accretion of solid matter takes place, and the valve-cover is lifted from its seat.

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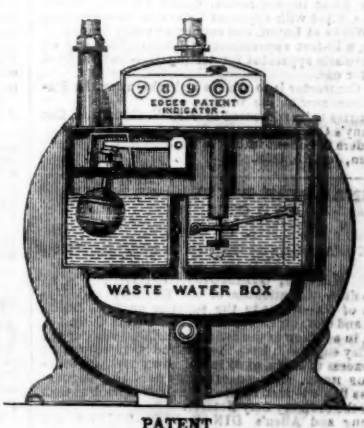
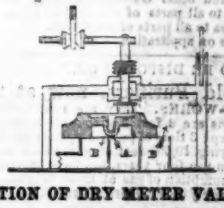


PATENT LEVER VALVE WET METER.



SECTION OF DRY METER VALVE.

GAS-WORKS ERECTED FOR LIGHTING TOWNS AND NOBLEMEN'S AND GENTLEMEN'S MANSIONS.

JOURNAL OF GAS LIGHTING NEWSPAPER ONE PENNY

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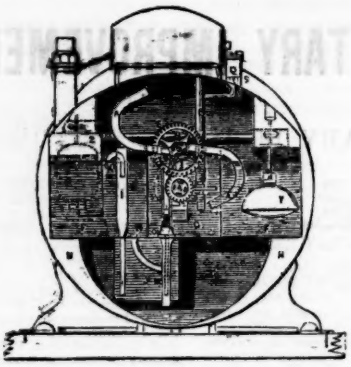

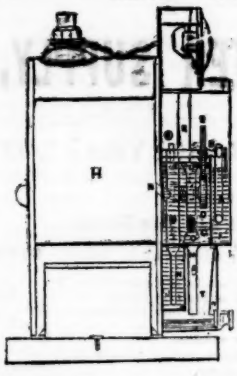

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W. CROSLEY'S AND CROSLEY AND GOLDSMITH'S
PATENT STANDARD SELF-ADJUSTING AND COMPENSATING GAS-METERS,

By which the True Water-Line is constantly maintained, and accuracy of measurement at all times secured. SEVERAL THOUSANDS OF THEM HAVE BEEN FIXED, AND ARE NOW AT WORK, and numerous Testimonials from eminent Gas Engineers, expressive of their approbation of them, may be seen at the Manufacturers'.

Manufacturers of LOWE'S PATENT MOTIVE-POWER METER, for situations where there is an inadequacy of pressure to supply the special requirements of certain consumers in low grounds during the day or night.

Also, Manufacturers of EXPERIMENTAL METERS, GASHOLDERS, GOVERNORS, MINUTE-CLOCKS, PHOTOMETERS, &c. &c., similar to those used by Mr. King, of Liverpool.

C. and Co. continue to manufacture ordinary WET METERS of the very best description, Mr. W. Crosley having been for many years the principal and confidential assistant of his relative, the late Mr. Samuel Crosley, of Cottage Lane, City Road, up to the time of his decease, in which capacity he communicated to W. C. the secret of the mixture of the metals which has rendered the Crosley Meter so durable and superior to all others, as is evidenced by a large number of them being still at work after having stood the test of nearly a quarter of a century's use.

LIVESEY FIRE-CLAY WORKS,

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ORLANDO BROTHERS,
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AND EVERY DESCRIPTION OF
TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.
FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

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Also, a 10-feet experimental GASHOLDER and all the requisite apparatus for testing Gas-Meters, fixed ready for use.

The Contractor is to remove and take away the Station-Meter now on the Works.

Inquiries to be addressed to Mr. W. PHILLIPS, Gas Company's Office, LUTON.

Tenders to be sent in before the 30th inst.

Luton, Jan. 15, 1858.

DINAS FIRE BRICKS, RETORTS, AND CEMENTS.
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MANUFACTURERS OF DINAS FIRE BRICKS AND RETORTS,
NEATH, GLAMORGANSHIRE,

Beg to draw the attention of the Engineers and Managers of Gas-works to the superior quality of their goods, and more especially to their BRICK RETORTS, which, in addition to the almost infusible nature of the Fire-Clay employed, have the great advantage, from its large excess of Silica, of EXPANDING BY THE APPLICATION OF HEAT, and consequently becoming sounder and less liable to leak by use. Their cost is less than that of the ordinary Clay Retorts.

Young and Allen's DINAS FIRE-BRICKS and CEMENT have been long used for the linings of furnaces exposed to high temperatures, and are well known in the London and other Gas-works. They can be forwarded by rail to all parts of the United Kingdom, and shipped by sea to all parts of the world.

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TO BE DISPOSED OF.

THREE Old Purifiers, now at the USK GAS-WORKS. They are round shape, and the dimensions are 2 feet 3 inches diameter, and 2 feet 3 inches deep; 3 tiers of punched plates for lime, capable of purifying 10,000 feet of gas in 24 hours. They have been in use four years, but have proved too small for the consumption of gas at these Works. To treat for the sale, apply to Mr. JOHN CHERRY, Manager, Usk Gas-Works.

Dated this 9th day of January, 1858.

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WANTED, by the Proprietors of the Gas-Works, Northwich, Cheshire, a Man competent to superintend the Manufacturing of Gas, the Repairing of Meters, and to do the Fittings required by the Company. Salary, 30s. per week, with House, Coals, and Gaslight. Testimonials as to fitness, age, &c., to be sent in to them on or before the 13th of February next, and the appointment to take place at the Works on the 3rd day of March, at eleven o'clock, when candidates who are expected to attend will have notice.

The successful Candidate to enter on his duties on the 18th of March next.

EIGHTON MOOR GAS COALS.—Parties wishing to be supplied with these first-class Gas Coals will please to apply to Mr. MATTHEW NESBIT, EIGHTON MOOR OFFICE, NEWCASTLE-UPON-TYNE. These coals are well known as among the richest in gas, and working the roundest on the River Tyne. They are extensively used by metropolitan gas works.

TO THE GAS COMPANIES
OF GREAT BRITAIN AND THE CONTINENT.

CANNEL AND COAL FOR GAS PURPOSES.—Fifteen years' connexion with one of the largest Gas Concerns in England, enables us from practical experience to certify that the CANNEL and COAL we offer are those best suited for Gas purposes.

On application, we shall have much pleasure in forwarding our Tabulated Statements of Analyses, with Prices and Terms; also References as to respectability.

All Contract Orders have our careful and best attention.

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HARRIS AND PEARSON,
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BEST CLASS-HOUSE POT AND CRUCIBLE CLAY
MANUFACTURERS OF
FIRE BRICKS GAS RETORTS &C.
AMBLECOTE FIRE CLAY AND BRICK WORKS,
STOURBRIDGE.
Late in the occupation of J. and W. King.
Originally J. Pidcock, Esq.

BENJAMIN GIBBONS, Jun.,
DEEPDALE FIRE-CLAY AND BRICK WORKS,
Near DUDLEY,

Manufacturer of every description of Fire-Bricks, Lumps, Quarries, Shields, Flue Covers, &c., to any size or shape required.

FIRE-CLAY RETORTS,
TO MODEL OR DRAWING.

B. G. begs to call the attention of Gas Companies to his Fire-Clay Retorts, which have been used with great satisfaction in some of the largest Gas-Works in the Metropolis and many Provincial Towns in England.

References given, if required.

JOHN ROGERSON and CO.,
NEWCASTLE-ON-TYNE AND MIDDLESBRO'-ON-TEES.

Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

GASHOLDER FOR SALE, 80 feet diameter by 20 feet deep. Manufactured by B. WHITEHOUSE, and in good condition, with 6 Guide Columns and Guide Wheels complete. For further particulars apply to Mr. THOMAS G. BARLOW, 42, Parliament Street, WESTMINSTER, S. W.

WILLIAM STEPHENSON & SON,
THROCKLEY,
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MANUFACTURERS OF EVERY DESCRIPTION OF
FIRE BRICKS, CLAY RETORTS, LUMPS, TILES,
&c. &c.
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A large stock of Fire-Clay Goods always on hand in London, at the lowest wharf prices, at Messrs. CHRISTIE and Co.'s Wharf, 64, Bankside, SOUTHWARK.

WANTED, to take the Management of a Gas-Work on the Continent, by one who has served in the same capacity. Understands every department and routine of a Gas-Work. First-class references will be given, and security if required.

Address, K. A., in care of the Publisher of JOURNAL OF GAS LIGHTING, 11, Bolt Court, FLEET STREET.

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NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

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Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JANUARY 19, 1858.

NOTES UPON PASSING EVENTS.

An eminent political writer once said, by a species of Milesian figure of speech, that "the opinion of foreigners was the opinion of a contemporaneous posterity." There is much truth in this assertion; and it is because we are convinced that this is really the case, that we attach so much importance to some parts of the report by the American Instructor of Naval Gunnery, Captain Dahlgren, to his immediate superiors, on the English Ordnance establishments at Enfield and Woolwich. Captain Dahlgren describes, firstly, the buildings and machinery (entering with much skill into the practical details of his subject, which are of a nature to exclude them from our columns), and he concludes by discussing the policy of the State turning manufacturer, as our Reforming Government appears lately to have done on a very large scale. The opinion of our "contemporaneous posterity" certainly is unfavourable to the system thus introduced; and it is worthy of remark that even the *Times* agrees in the main with the principles Captain Dahlgren appeals to when thus expressing his condemnation of costly Government factories. But the public in general does not seem to have paid much attention to the question raised, and our military authorities are meanwhile proceeding with the construction of the rifle and cannon factories, which will eventually render the State independent of private industry for those articles. Yet the principle involved is a very serious one; and, moreover, the results hitherto attained in our State manufactories have been so far from satisfactory (in shipbuilding or naval docks, for instance), that it would really appear essential again to call attention to a subject of such importance.

The Ordnance authorities state in their own defence that so long as they depend upon private industry for the supply of the peculiar articles they require, they cannot be sure of obtaining such a supply within the necessary periods, or of obtaining goods of a proper quality. Possibly, with the existing organization of our War Administration, which seems to have been established in direct opposition to the principles of experience or common sense, there may be some truth in these objections to the opinion of these persons who would not allow the State to turn manufacturer. But it is very strange that the contingencies of a great national service cannot be foreseen with sufficient certainty to enable its administrators to provide against any ordinary delays or neglects on the part of its furnishers. A very trifling amount of forethought would enable any of the departments of State to order the goods it requires at favourable periods; and then, if the contracts were properly drawn, and the modes of reception honestly regulated, there ought to be no reason for finding fault with the quality of the goods taken into store. But the fact is, that the heads of offices do not know how to draw up a contract, nor are they willing to be taught such vulgar commercial details; and thence it is that they feel the necessity for having at their own command factories which should, as far as possible, guarantee them from the consequences of their own ignorance. The nation, however, pays dearly for this mode "of making things easy" for place-holders; and earnestly do we invite Administrative Reformers to inquire into its real working expenses. The first outlays for buildings, machinery, plant, stock, &c., at Woolwich and Enfield, must have been enormous, and the interest and depreciation must also form an important charge in the military budget. Then, the experience of all public companies or corporations warrants the belief that after an outlay of this description has been incurred, a corresponding demand will be made upon the establishment so created in order to make it appear of use. The countless number of ships lying in ordinary—or, in other words, built in our dock-yards apparently only to rot without even going to sea—may be appealed to as illustrative of the effects of our Governmental trade operations; and, moreover, the notorious inferiority of the vessels of our navy in all the ordinary conditions of ship-building, as compared with those built in private yards, must inspire equal dread as to the practical results of the new experiment. It may be, and no doubt was true, that many guns lately delivered to the army were of such bad metal as to have been nearly useless; and it may also be the case that the tools of the new cannon and rifle factories are superior to those actually used by private traders. But, in the first instance, why were guns of bad metal received at all? Could not the Ordnance authorities tell good metal from bad? And, if they were so ignorant, then, of the first and most elementary detail of their business, is it safe, now, to give them the disposal of the funds necessary for a manufacture? In the second instance, it must also be observed that the progress of invention will soon cause the tools now used to be comparatively worthless; and is the State to run a race with private industry? Assuredly it will be beaten if it should enter on such a course; yet, if it do not, we shall be condemned to see our army supplied with weapons of an inferior kind at some future period.

It is precisely on account of the species of immobility thus practically cast upon public operations that we consider it so inexpedient to allow the State, or even municipal corporations, to become traders; and we therefore quote with satisfaction, as an independent confirmation of our opinions, the Dutch legislation on these subjects, as it appears from a remarkable recent case to be decided. The case to which we refer is as follows:—At Bréda the municipal council decided upon executing the gas lighting at its own expense, and for the account of the town; but some of the inhabitants objected to this operation, and the Minister of the Interior is understood to have refused his consent to its being carried into effect, precisely because it is against the Dutch law that municipalities should become traders. Unfortunately, our worthy neighbours have not carried out this principle logically in other cases, and they have allowed the State itself to undertake the drainage of the Harlaem Lake; but even the latter comparatively successful operation is an illustration of the danger of the course therein adopted. The cost of reclaiming that land has been far greater than was necessary, and now the State is burthened with the maintenance (in a direct or an indirect manner) of some large and expensive steam machinery, far in excess of the requirements of the case. Laws, however, are the expression of the reason of a nation, even when its practice may be in apparent contradiction to them; and so we cite the Dutch law with respect to municipalities with satisfaction in support of our views. Would that

our cities in the North of England had been under such a system, and that the Manchester School had been prevented from inflicting the mischief it has done by means of the gas and water operations carried out under its auspices! Still more earnestly do we hope that our Legislature will pause ere it allows the Government to proceed further in the mischievous course it has lately adopted. There is even a constitutional objection to be raised to the system of State manufactures, viz., that it increases the means of corruption in the hands of the Government—and surely we in England need no increase of this description!

There have recently occurred on the Continent several curious illustrations of the inefficacy of the Governmental supervision of public works, which may still further be referred to as arguments against the development of the irresponsible power so often mentioned above. Thus, to cite two of these illustrations—At Turin a theatre is said to have been entirely destroyed because the *lead* pipes through which the gas was passed were melted at an early period of the fire, and the rigorous police superintendence of the town had not sufficed to ensure the simple precaution of placing a stop-cock on the inlet. Again, at Paris, a sad accident occurred at St. Sulpice through the bursting of a hot-water apparatus, and yet no work of this kind is allowed to be executed in France without the previous examination of the plans, specifications, &c., by several learned commissions attached to the service of the municipality or of the Minister of the Interior. Accidents enough happen amongst ourselves, we are well aware, and English engineers and architects should not claim any merit for their superior success. But the fact certainly is, that when the public looks to higher authorities for the discharge of duties properly incumbent on itself, the consequences of the mistakes those authorities may make are more likely to be serious than when the parties directly employed feel the real nature and the full extent of their responsibility. The evil of "guidance" in these matters lies, precisely as Mr. Toulmin Smith very properly says, in the interference with the sense of individual discretion and responsibility; to which we would also add, in the destruction of originality and the discouragement of invention.

We observe, in a recent number of the *Bury Post*, that the Paving Commissioners of that town, arguing from the diminished mortality observed in their district this year, object to the execution of the works necessary to improve the watercourses of their district. They had actually executed a portion of their intercepting sewer in the beginning of the year, so that a similar system of logic to the one they adopted would entitle the advocates of further improvement to assert that the diminished mortality was attributable to what had already been done, and that the completion of their sewerage might confer upon their town the painful privilege of immortality. But, joking apart, it is unfortunate that the *post hoc, propter hoc* style of argument introduced by our Registrar-General should find so many imitators. In Holland we would observe that this year the mortality has been very great, and marsh fevers have prevailed to a fearful extent. From these facts we infer that the warm, dry summer may have been favourable to the health of a town situated, like Bury St. Edmund's, on a chalky soil, whilst it has, on the contrary, been fatal to the dwellers in marshy, damp countries; and there would equally be danger in attributing to any one cause likely to affect the public health the results of the united effects of many causes. The people at Bury have great cause for thankfulness, on account of the improvement of their sanitary condition this year; but we warn them that the indications of one year alone are not sufficient to warrant any general conclusions; and, even that if it were true that the foul state of the natural drainage courses of their town were not injurious to the public health, this assumed fact would not protect them against the claims of any individual who might be legally injured by the present state of things. Certainly, if the inhabitants of Bury can establish the principle that a diminished mortality in any one year is a reason for not undertaking the cleansing of the public watercourses, the inhabitants of London may appeal to their case as a reason for not improving the Thames. The mortality of London has, indeed, been singularly favourable this year; yet we question very much whether on this account the Legislature would exonerate the Metropolitan Board of Works from its principal obligations. In all these cases the danger lies in neglecting or in attaching too much importance to an exceptional event. The healthiness of any district can only be judged by observations extending over a number of consecutive years; and, as the cycle of our seasons in England returns in about 19 years, the law of mortality in any place cannot safely be ascertained within a shorter period. The Registrar-General's period of seven years is, therefore, only a little less illogical than the one-year period of the Paving Commissioners of Bury St. Edmund's.

The crusade against smoking chimneys has recently been revived with additional energy on the part of the police spies. It is inconceivable that manufacturers should continue to tolerate the present absurd and vexatious law upon the subject.

THE GAS STRUGGLE IN CORK.

The *Jupiter Tonans* of the *Cork Examiner* announces that "the citizens of Cork are now fairly on their trial, whether they have the spirit of men or the cowardice and meanness of slaves;" and he is further moved to say, "we feel that the honour of our fellow-citizens and the credit of our country are involved in the struggle upon which we are entering." What, it will be asked, is the momentous question which thus involves the honour of the citizens of Cork and the credit of Ireland? It is neither more nor less than this—whether they will accept an offer for the supply of gas at 2s. 6d. per 1000 feet, or whether they will prefer paying nearly double the price. Viewing the question by the light of plain common sense, it might be supposed there was no very sore trial in making the choice, and that the credit of Ireland would be best supported by accepting the lower offer. But the editor of the *Cork Examiner* gives an opposite complexion to the case, and he endeavours to make it appear that, to supply gas so cheap as that, is "insulting and offensive," and "a foul imputation" onthe citizens.

Our readers are already acquainted with the circumstances of the patriotic gas movement in Cork, and of the formation of a consumers' company for the supply of Irish gas made from English materials by a Scotch engineer, for the purpose of supplanting the United General Gaslight Company, who have satisfactorily lighted that city for many years. The knot of agitators, headed by Mr. Maguire, ex-editor of the *Cork Examiner* and M.P. for Dungarvan, with a zeal and perseverance worthy of a better cause, unexpectedly succeeded in constructing gas-works, in laying down mains, and in lighting the street lamps of the city at the opening of the new year. For enjoying the luxury of national gas the citizens had to pay 5s. per lamp more than if they had been supplied by the United General Gaslight Company. The corporation, however, is a highly patriotic body, over whom the member for Dungarvan exercises great influence; therefore it might be expected that the members dealing, with the funds of their fellow-citizens, would not grumble at paying rather dear for their whistle. But it becomes a very different question when the supply of the great body of gas consumers is concerned, of whom Mr. Maguire says that, "Irishmen as they are," they are as 'cute to their own interest "as the sharpest stock-jobbers on the Exchange of London or Liverpool." It is to this class of customers that the gas companies must principally look for support. When the United Company lowered their price to 4s. 6d. we predicted that the Consumers' Company, who then proposed to supply gas at 5s., must come down to the same price. They did so, though it was declared to be barely remunerative. The United Company have now taken a bolder and more hostile course, to which they have been exasperated by the series of attacks and insults to which they have been exposed by the leading agitators of the Consumers' Company. At the opening of the new year, they reduced the price of their gas in Cork to the ruinously low rate of 2s. 6d. per 1000 feet, free of meter-rent. At a meeting of the Cork Market Trustees on the last day of the old year, a tender was made on behalf of the United Company to supply gas to the lights in the market building for twelve months at that rate. A tender was made at the same time by the Consumers' Company at the rate of 4s. 6d. The mode of reception of the former tender by the trustees was as extraordinary as the tender itself. It was condemned as an "ungracious proposal," which ought to be rejected at once, without a word spoken in its favour—and the tender at nearly double the price was accepted! So eager were the trustees to accept the offer of the Consumers' Company, that they overlooked the illegality of the transaction, for, as shareholders of the new company, they were prohibited by their Act from being engaged in such a contract. When that difficulty was brought to their notice by a gentleman who represented the United Company, he was offensively told that he had made his last speech and dying declaration. Never, we believe, in the

annals of public bodies was such a reception given to the lowest tender made by a highly respectable and old established company.

The citizens of Cork will look more closely after the pounds, shillings, and pence, than members of public bodies who expend money not their own, and the Cork Consumers' Company must expect to lose eventually nearly all their private customers unless they reduce their price to the same ruinously low level as their powerful competitor. For a short time, indeed, whilst the excitement lasts and the strongly persuasive measures of "gibeting in the newspapers" and commercial excommunication are practised, many of those consumers may be retained by affection or fear, but those motives for influencing transactions are not to be relied on when self-interest points in the opposite direction. It is not difficult to foresee what will be the end of the game of "Beggar my Neighbour" which has now been begun in Cork. The shareholders of the Cork Gas Consumers' Company (Limited), finding their capital rapidly wasting away, will enter into a compromise with their wealthy rival, and the results of the agitation for Irish gas in Cork will be sad experience gained, and the restoration of the price to a remunerative standard.

Some of the public writers in Ireland enjoy the privilege of saying of their countrymen, without offence, what if written by an alien scribe would rouse a storm of indignation. The editor of the *Cork Examiner* seems to be one of this privileged class. For the purpose of inciting the citizens of Cork to stand firm in the hour of trial, he mentions the taunts that have been thrown at his countrymen, which, he says, every page of Ireland's history shows that a few base knaves and rascals have justified; and he calls upon the citizens of Cork to wipe away such stigmas of national baseness by their conduct in the present crisis. "It has often been said," he remarks, "'Put an Irishman on a spit and you will be sure to get another to turn it.'" This supposed climax of baseness has been realized by the member for Dungarvan himself. He has ruthlessly impaled his compatriots on the spit of the Cork Gas Consumers' Company (Limited), and with his own hand he relentlessly turns it to ensure their being "done brown."

Circular to Gas Companies.

The movement in the metropolitan parishes against the districting arrangements of the gas companies has advanced to the point of agreement of the delegates in a general form of a petition to Parliament for protection against the effects of threatened monopoly. But the courage of the delegates seems to flag as the time for action draws near. After the furious denunciations of the gas companies and the many complaints of specific grievances, it might have been expected that a telling case would have been got up, urgently calling on Parliament to interfere in the management of the gas companies, or to give the parishes parliamentary powers to set up separate gas-works for themselves. But the petition, which has been a long time in concocting, avoids the statement of positive facts, and presents not the shadow of an existing grievance. Notwithstanding all the valorous talk of the parish orators; notwithstanding the indiscretion of one of the gas companies, which gave the delegates a handle to seize hold of; notwithstanding the positive assertions of other grievances, made at their former meetings, the delegates now hush their high sounding words, they suppress even the appearance of grievance they possessed, and all they venture to tell the House of Commons is, that they are "informed and believe" that the gas companies contemplate doing certain acts which may be prejudicial to the interests of the petitioners. A more lame conclusion to a formidable-seeming agitation can scarcely be conceived; and it will place the parish agitators in no favourable position with their constituents. Some attempts were made at the meetings of committees and at the general meeting of the delegates to give a firmer tone and greater pungency to the petition, but it was deemed most prudent to confine the averments to facts that could be directly proved, and to leave the introduction of special grievances into the petitions from those districts which have already experienced the effects of the districting arrangement. This prudence is certainly commendable, but it would have been far better if the delegates had exercised it in their statements to the parishioners instead of recklessly rousing their indignation against alleged grievances, which it seems, from the form of the general petition, may be altogether imaginary. The delegates have, indeed, mustered courage to "submit that the several gas companies should be restricted by legislative enactments to a maximum charge for, and be bound to a particular standard in, the quality of the gas supplied." This is a bold demand to found upon nothing, for the arrangements of the gas companies complained of are but a mere question of "information and belief" to the petitioners. It is not probable that Parliament will interfere to redress anticipated grievances; and, so far as the petition shows, the parishioners have no actual grievances to complain of.

It is said, indeed, that the memorial to Sir George Grey is to be a more stinging affair. In going before the Home Minister, supported by Sir Benjamin Hall and other metropolitan members, the delegates may venture to make assertions which they might be called upon to prove if made in a petition to the House of Commons; hence there is still valorous talk of bringing before the Home Secretary statements which are not fitted to be made in Parliament. It is probable that, as the time draws nearer, the courage of the delegates may again fail, and that the grievances which now seem so afflicting may, like many other of the grievances mentioned at these parish meetings, vanish into thin air. At all events, the parishioners of the metropolis must present to Sir George Grey and the House of Commons something much more substantial than the shadowy grievances set forth in this deliberately-prepared petition, before they will be able to induce either to consent to the appointment of a committee of inquiry into the affairs of the gas companies of the metropolis.

We cannot, however, forbear alluding to a mare's nest into which the delegates have been entrapped, through a statement made by Messrs. Hofmann and Witt, in their report to the Government referees on the plans for the main drainage of the metropolis, in which it is said that, "According to an estimate of George Lowe, Esq., C.E., engineer to the Chartered Gas Company, London, the annual consumption of coal for the purpose of gas-making in London is about 840,000 tons, which would yield 7,728,000,000 cubic feet of gas. The value of this volume of gas would be (at 4s. 6d. per 1000 cubic feet) £1,738,000." The wording of the paragraph has led the delegates to believe that 9200 feet of gas was sold at 4s. 6d. per 1000 feet for each ton of coal consumed, whereas Mr. Lowe's share in the responsibility of the statement is limited to the estimate of the consumption of coal, an estimate which, we believe, considerably exceeds the actual quantity.

The anxiety of the public to learn the nature of the award in regard to the matters in dispute between Mr. Croll and the Great Central Gas Consumers' Company will probably soon be gratified, as we understand it was officially made on the 16th inst., and now only awaits the formality of being taken up by the parties to permit its contents being made public. Our readers will recollect that the original claim made on the company was for £34,783. 9s. 4d. This large sum was ultimately reduced in the course of the proceedings to £33,049, subject to a further deduction of £4091. 1s. 5d. for admitted dilapidations and over-payments made on account of stock in trade. The net claim, therefore, which had to be adjudicated upon by the arbitrators was £28,957. 18s. 7d. composed of the following items:—

Professional services in the formation of the company, and for six years' salary as the consulting engineer				£7,718	18 0
Gas misappropriated . . .	£9,458	16	6		
Less payment made by the company on account thereof . .	4,903	12	11		
				4,555	3 7
Gas supplied between June 24 and July 25, 1857				1,123	17 0
Lighting, cleaning, and repairing sundry private lamps				351	0 0
Extra cost of manufacturing gas for illuminations in May, 1856				100	6 0
Extra railway dues, paid in consequence of the company not having completed the purchase of the siding into the works				1,159	3 8
Extra illuminating power of gas, supplied at the rate of ½d. per candle per 1000 feet, beyond 9½ candles				18,040	11 9
Carried forward				£33,049	0 0

Brought forward				£33,049	0 0
Less admitted dilapidations for which Mr. Croll was liable .	£4,000	0	0		
Excess in payment on account of stock beyond the valuation .	91	1	5		
				4,091	1 5
				£28,957	18 7

On the other hand, the company repudiated all liability to the payment of any portion of the above, alleging that all the current accounts were balanced, and that the contingency under which any claim for the extra illuminating power of the gas supplied could arise—viz., the payment of 10 per cent. dividend to the shareholders—had not arrived; and, consequently, that this claim could not be at present entertained. They, moreover, set up the following counter-claims:—

Dilapidations, as agreed upon by the engineers on both sides	£4,000	0	0
Damages consequent upon the state in which the works were delivered up on July 25, 1857	4,566	5	4
Over-payments made on current account . .	521	5	7
Over-payments on stock valuation	91	1	5
	£9,178	12	4

At the 22nd sitting of the arbitration, upon the strong expression of the umpire's opinion that the 26th section of the company's Act rendered illegal the stipulations of the contract with regard to the mode in which payment was to be made for the extra illuminating power of the gas supplied, the chairman of the company consented to admit £7245. 7s. 7d. of the amount claimed by Mr. Croll on this head, provided the payment was distributed over seven years in half-yearly payments, commencing on Jan. 1, 1859. This sum was arrived at by calculations founded on the daily observations of Dr. Leeson and his assistant, the accuracy of which was, however, objected to by Mr. Croll on the ground that they were conducted in a darkened chamber, whereas those of 1849, upon which his original contract was founded, were made in an ordinary room, where the reflected and diffused light added 25 per cent. to the effect of the direct light emitted from the gas itself; so that what Dr. Leeson reported as being 12-candle gas was really 15-candle gas, if tested by the means employed in 1849, when the contract was originally entered into; and on this ground Mr. Croll claimed £10,795. 4s. 2d. more than Dr. Leeson's observations showed to be due to him.

The case, therefore, finally went to the arbitrators as one in which, on the one hand, Mr. Croll claimed £28,957. 18s. 7d. as being due from the company, and on the other, the company claimed £1933. 4s. 9d. as being due from Mr. Croll. It can scarcely be expected that the award will entirely satisfy parties having such opposite views, but we have full confidence that substantial justice will have been done to both.

Postscript.—Since the above was in type we have received information that the award has been taken up, and that by it Mr. Croll is declared to be entitled to the payment of £10,379. 4s. 1d., in six half-yearly instalments of £522. 6s. 1d. each, commencing on April 1 next, and fourteen half-yearly instalments of £517. 10s. 6½d., commencing on Jan. 1, 1859, the whole without interest. Each party is to pay his own costs in the arbitration, and the costs of the award are to be paid by them in equal moities. This award is virtually one for £14,785. 19s. 1d. in Mr. Croll's favour, as the sum awarded is in addition to admitted counter-claims of the company, amounting to £4406. 15s.

MIS-STATEMENTS AT THE GAS DELEGATES' MEETING.

We are requested to make the following corrections of an error made by Mr. Kintrea with reference to the price paid for public lamps in Camberwell, in his speech at the meeting of the gas delegates held at the Marylebone Court House on the 2nd of December last:—

Extract from a Speech of Mr. Kintrea *on the Metropolitan Gas Question, delivered at the Marylebone Court House on Wednesday, December* 2, 1857.

They were paying now in Camberwell for their public lights to the Phœnix Company £5. 7s. 6d. per light. The South Metropolitan had very coolly handed them over to the Phœnix without letting them know anything about it, or consulting them in the slightest way. (Hear.) There could not be two opinions as to what their object was in their amalgamating—it was to raise their price, and do as they please. If he needed an illustration of the kind, he need only refer to the report of the half-yearly meeting of the shareholders of the Imperial which he held in his hand. On the subject of the division of the metropolis by the gas companies, one gentleman—he thought it was Mr. Box—said, "There could now be no under-selling between the companies"—(hear, hear)—and another made the unmistakable observation, "That their customers were now entirely in their own hands." ("Hear, hear," and cries of "Shame.") That was pretty good evidence of what they had to expect from the gas companies. He would, therefore, gladly support a proposal which breathed the spirit of free trade and fair competition. (Hear, hear.)

Corrected Statement.

For about 43 lamps the Phœnix are charging £4. 17s. 6d. only, although they might have enforced an unexpired contract for 16 of these lamps at £5. 10s.

For three other lamps, 10s. per lamp beyond the above is charged for extra lamp lighting, on account of these three lamps being double (120 yards) the usual distance apart, without private lighting thereon.

For nearly all the lamps in the parish (about 500) the Phœnix, down to Michaelmas, 1853, had charged only £4. 4s. for a five-foot flame, and the South Metropolitan Company have taken up the contract from that time *at the same price*, and are charging only £4. 4s.

Extract from a Speech of Mr. Kintrea *on the Metropolitan Gas Question, delivered at the Marylebone Court House on Wednesday, January* 13, 1858.

Mr. Kintrea wished, in fairness to the Phœnix, to correct a statement he had made at a former meeting with respect to the charge by that company for public lights in a portion of the district of Camberwell. At the first meeting he had stated that the Phœnix charged £5. 7s. 6d. for public lights which they supplied. He did not mean that was the amount for all the lights; and he found that, of the public lights supplied by the Phœnix, 47 were charged at £4. 17s. 6d., and he believed considerably more than half the public lights were charged at that sum, although he was correct in the statement that £5. 7s. 6d. was the maximum charge.

Correspondence.

ARE EXHAUSTERS NECESSARY IN SMALL GAS-WORKS?

Sir,—Will any of your numerous readers oblige me with their opinion as to how many clay retorts will justify the cost of working an exhauster? Without an exhauster, it does not appear to me that clay retorts can be *usefully* worked more than two years. I shall be glad to hear what is the experience of other managers. With an exhauster, how long may they be worked? and what is the cost in wages of working an exhauster? We have a steam-engine at work, but it requires very little attention. I presume an exhauster would require the *constant* and *entire* attention of an engine-driver day and night. Any information from those who have employed an exhauster on a small gas-work will be interesting to your readers, and especially to

A Subscriber *ab initio*.

Register of New Patents.

1713.—Thomas Spencer, analytical chemist, of 21, Southampton Place, Euston Square, London, for "*Certain improvements in the purification of water, and other fluid and gaseous bodies.*" Dated June 19, 1857.

The said invention consists in a method of effecting the purification of water, and rendering it wholesome and fitted for all domestic and manufacturing purposes, and also for depriving alcoholic fluids of certain impurities which are incident to them in the process of distillation. For the better understanding the nature and character of the improvements embodied in the first part of this invention, the following preliminary statement is necessary:—

Improved drainage and increasing urban population have, in a number of cases, caused the inhabitants of large towns in these kingdoms, as well as persons connected with manufactures which require pure colourless water, to collect for their supply that which has fallen on the surface of rural districts, or that of streams issuing therefrom. As the purest water under these circumstances is obtained from districts the least cultivated, those which are covered with bare moorland vegetation are generally resorted to.

It is known, however, that water so obtained, though in other respects pure and soft, is more or less coloured by the juices of the vegetation on which it has previously fallen as rain. This tinge of colour, together with that derived from the peat, or from patches of peaty earth which are often found in such districts, operates as an objection to its use for many domestic, and some manufacturing purposes.

It is also known that water, after its employment in several manufacturing and other operations, becomes thereby so much impregnated with colouring matter as to render it unfit for further use.

It is also known that by the decomposition of organic matters water becomes tainted with deleterious gases, such as those known to chemists as sulphide and phosphide of hydrogen, or, perhaps, the same are better known as sulphuretted and phosphoretted hydrogen. These, as well as ammoniacal combinations arising from similar causes, are often found in water where no tinge of colour is observed.

The first part of this invention is for the purification of such waters from any tinge of organic colour or deleterious gaseous body. To effect such purification, an oxide of iron is used, either in lumps or granulated by crushing to the state of ordinary sand, though the same may be used in a state of powder. It is to be remembered, however, that the rapidity of the mere filtering operation depends much on the relative coarseness of the oxide employed. This substance may be used in the above states by itself, but it is preferred to use it when mixed with variable proportions of sand or gravel, or with any material through which water is ordinarily passed to deprive it of suspended matters.

To remove from water, therefore, any of the above-named impurities, or all of them, the mode of proceeding is, in the first place, as if mechanical filtration alone were to be effected. For example: the purifying operation is performed in a filtering vessel, a filtering tank, or "filtering bed," either of which is made to receive the ordinary filtering media of sand and gravel, the only difference being that in this invention are mingled with every 20 parts of the top layer of sand from 1 to 2½ parts, by measure, of oxide of iron, the quantity of the latter depending on the relative impurity or colour of the water to be treated, as well as the quality of the oxide itself. Besides which, should the particles of a given quantity of oxide be in a relatively finer state than ordinary sand, less of the former is necessary, though it must be remembered that the process of enfiltration will then proceed with less rapidity than if the particles of oxide were in a coarser state.

The patentee's opinion is, however, that the exact quantity of oxide requisite to be employed in these operations cannot be practically laid down with greater precision, inasmuch as the purifying quality of this substance in its natural state is in itself subject to variation. A given quantity, for example, of that derived from the mines of one district will operate more effectively than a similar bulk from another. Indeed, a slight variation is in this respect found in different parcels derived from the same mine, as one of them may contain a larger proportion of inert peroxide, or earthy matter, than the other; preliminary trials, therefore, will in some cases be necessary. In all ordinary ones, however, quantities ranging within the above limits (though the inventor does not confine himself to them) will render impure water instantaneously colourless, and free from all odour.

Where the extent of the operations are commensurate with the supply of a town or manufactory, the top layer of mixed filtering sand and oxide ought to be from twelve to eighteen inches in thickness; all beneath may then consist of the usual layers of coarser sand, gravel, or shingle, the thickness of which, being indifferent to this invention, may be regulated at pleasure. It will thus be seen that the only alteration proposed to be made in the ordinary filtering media is the addition of the above proportions of oxide to the sand or substance usually employed in mechanical filtration.

In respect to domestic filters, or those on a relatively small scale, the proportions of oxide to sand may be advantageously increased as a thickness of twelve or eighteen inches of filtering media in such cases is inconveniently large. If in these cases, therefore, the proportions of oxide to sand be increased to a third, or to equal parts of each, four or five inches of filtering media will be found to effect as perfect purification as if a thicker media containing less oxide were used. It will, however, be sufficiently obvious that intermediate proportions of the oxide may be employed, varying, if necessary, with the size of the filtering vessel and the state of the water to be purified.

Though sand or gravel are named to be mixed with the oxide as being readily procured, yet the said oxide may be used in combination with other filtering media, such as charcoal, coke, or porous stone, whether the latter be natural or artificial. Such stone may be used in a crushed state or in slabs, or it may be hollowed into vessels, and the purifying oxide placed within the same, or exteriorly to them.

Should the oxide whilst in use become in any degree inert by reason of filthy matters in very foul water, the same may be cleansed by washing, or it may be revivified by calcination. According to experience, however, inertness from such a cause is seldom likely to happen. In proof of which he may state that, during the preceding six months, experiments have been made with very impure and highly coloured water, almost daily, whilst other experiments have been continued for more lengthened periods, but in none of them has any renewal of the ferruginous filtering media taken place, nor in any case has he been able to observe a diminution of its powers of purification.

In a legal document, designed as a guide for practice only, it may be considered in some degree out of place to occupy any part of it in defining theoretical causes of phenomena; but as the explanation offered of the physical cause of this process of purification will render its practice much better understood, the following few words on the subject may not be unnecessary.

Observation and experiment have led the patentee to the conclusion that oxide of iron, containing less oxygen than the per, or sequi-oxide, possesses a physical power to attract atmospheric oxygen to its surface. Such oxide is generally known as the "magnetic oxide," from the power exercised over it by the magnet. This oxide, when found in combination with other substances, as in the spathose ore, consists of one equivalent of oxygen to one of iron; but when found uncombined, the mass is said to possess four equivalents of oxygen to three of iron.

The sesqui or peroxide, on the other hand, which is not magnetic, consists of three equivalents of oxygen to two equivalents of iron. This latter oxide, however, is not available in this invention. Although, as stated, the former oxide thus attracts oxygen to its surface, yet at ordinary temperatures, or while moist, it does not possess the power possessed by iron, under similar circumstances, of entering into chemical combination with this atmospheric gas. Though thus unable to combine with any additional oxygen, yet, in common with a few other substances possessed of similar properties in relation to this gas, this oxide possesses another, or it may be an extension of the same attractive power, which has the effect of inducing the oxygen in contact with its surface to enter into chemical combination with certain other bodies with which it is brought into contact.

It is well known that organic colouring matter, as well as most gaseous impurities, when in water, or moist, are rendered perfectly neutral on combining with atmospheric oxygen: in other words, they become bleached and purified by the combination. It is well known, however, that in the absence of an inducing force such as that possessed by this oxide, the atmospheric process is in practice a slow one, just as the analogous process of natural bleaching is slow as compared with modern processes. When, therefore, impure water is made to pass through filtering media containing this oxide, the atmospheric oxygen clinging to its surface is, in virtue of this peculiar power, induced to enter into instantaneous chemical combination with the impurities found in the water.

Although known to belong to some other bodies, this peculiar property, as far as is generally known, has not hitherto been recognized as appertaining to oxide of iron. By chemists it is termed "catalysis," which conveys the fact of chemical combination being induced in two bodies by reason of contact with a third, which third is not itself acted on. It may be mentioned here that it is found that the protoxides of manganese, nickel and cobalt, possess similar purifying properties, though they are not exercised nearly so powerfully as in the case of the ferruginous oxide.

Without vouching in all respects for its correctness, this explanation of the process is strongly corroborated by the conditions necessary to be observed in practice. For example, should the top layer of moist sand and oxide in the course of the process be exposed to the atmosphere for a few seconds only, purification will proceed subsequently with greater rapidity than before. An interval of no longer duration, therefore, is amply sufficient to re-cover the surface of the oxide with a fresh coating of oxygen. On the other hand, should the top layer be submerged to a considerable depth, and the oxide become thereby unable to attract a fresh supply of oxygen from the atmosphere, purification is then less perfect. In such a case no other oxygen is available but that belonging to the air contained in the water. Under these circumstances, should the water be very impure, the oxygen contained in it will scarcely be found sufficient for its purification. At the same time, with water of no great impurity, the oxygen mingled with its intersticial air will be found sufficient to effect its purification, especially should the top layer of sand and oxide be of the greater thickness above named.

For these reasons it is preferred, as a general rule, that the water which enters the filtering tank should not be permitted to accumulate to a greater height than two or three inches above the purifying media. This condition may be easily regulated on any required scale by keeping the aperture of discharge relatively larger than that admitting the water to be purified. At the same time no claim is here made for any mode of filtration, but only for the application of the new material to the purifying purposes herein named.

Though it is probable that further experience may arrive at improved methods of producing the same effects by means of this oxide, the mode here described, however, which differs little from that practised in ordinary filtration, the patentee at present believes to be the best.

By following the process here described very impure and highly coloured water becomes instantaneously possessed of all the purity and freshness of spring water. Moreover, there can be little doubt that it is to the agency of the same ferruginous oxide we are so much indebted for the natural process, whereby impure water from the surface becomes converted into the "spring water" of the well.

In the second place, with respect to the purification of other fluids:—It is well known that newly-distilled spirituous liquors, as whiskey, rum, brandy, or such other alcoholic fluids, are, when drank in such a state of newness, especially injurious to the human system. This arises because of the presence of certain essential volatile bodies in a semi-gaseous state, which are more or less incidental to the distillatory process, though especially so when the spirit is distilled from inferior materials. Chemists have not yet strictly determined the composition of these deleterious compounds, but it is known their effects are neutralized by oxidation. In practice, the oxidizing process is virtually performed by storing the spirits for indefinite periods in wooden casks or other vessels which are not beyond the influence of atmospheric oxygen.

For the purpose of correcting these injurious properties in shorter periods the inventor causes, by his invention, the newly-distilled spirits to be passed or filtered through a layer of the before-mentioned oxide of iron, which may or not be mixed with any other filtering media, as in the general manner described as regards water.

In the purification of spirits, however, it is found, as a rule, that the best effects are produced where the filtering media is composed of equal parts of the oxide and the purest sand, though pounded glass or charcoal may be substituted for the two latter. The thickness of the media in these cases may vary from one to three or four feet, but which will altogether depend on the amount of impurity to be discharged from the spirit; or the spirits may be passed through the media a second or even a third time.

It is further recommended that the spirit to be purified should be allowed to pass through the filter at intervals; that is to say, as soon as the filtering media becomes saturated with the fluid to be purified, no addition should be made until the first charge has reached within about an inch of the bottom of the filtering layer, and so to continue during the process. The required depth in this case may be readily ascertained by having a glass gauge attached to the outside of the filtering vessel, which will communicate with the fluid within.

The increased thickness of the layer of filtering media now recommended is to prevent the necessity for having a large surface, which would promote the wasteful evaporation of the spirit to be purified This process, however, is best conducted in covered vessels.

The oxide of iron which it is preferred to use for the purposes of purification herein enumerated is that obtained by calcining the natural protocarbonate of iron, which substance is known to mineralogists as the "spathose ore." Whilst in combination with its carbonic acid, the oxide in this ore is composed of one equivalent of oxygen to one of iron. After

the gaseous acid is driven off by heat, a black oxide remains, which, by subsequent experiment, indicates a somewhat higher degree of oxygenation in the whole mass; but whether the calcined oxide consists of the protoxide with some peroxide in a state of combination, or merely in a state of mixture, is a question of little practical moment as regards this invention.

Though it is preferred to use the oxide obtained from the spathose ore, as being the purest, that found naturally as "magnetic iron ore" is also available. Available oxide for the same purpose is also obtained by calcining the well-known hematite ore. This operation is best performed by previously reducing the ore to a granular state, and mingling it with carbonaceous matter, such as coke or charcoal. When calcined sufficiently, it becomes magnetic. By a similar process of calcination ferruginous sands are likewise made available. Those sands, however, which contain oxide of iron in the magnetic state do not require to be calcined. The smithy scales derived from the forging of iron are, in like manner, available, as they chiefly consist of an oxide which is attracted by the magnet. The loam or sand which has been used for moulding cast iron is, in like manner, available as a purifying media for the purposes of this invention. This substance, after use, contains a large proportion of oxide of iron of the character required for purification. It is best cleansed from previous impurity by calcination. The mineral substance known as chlorite, which contains a large per centage of protoxide of iron in combination, is also available for the same purposes of purification. This substance is found as a greenish slate, as well as in amorphous masses. It is also found granular, as in "the green sand." Its purifying power is in several instances considerably increased by calcination.

It may be scarcely necessary to mention that, where oxide from the spathose ore cannot be conveniently procured, the other substances herein named, containing the same oxide, may be severally or collectively substituted; and also, that the spathose ore, before calcination, possesses considerable powers of purification, though inferior to its oxide alone. The ore in this state, therefore, if the water is not of a very impure character, may be used for its purification.

Oxide, for the purposes of this invention, may be obtained artificially—that is, by precipitation from a ferruginous salt, in the first place, and subsequently by calcination, though, from its extreme state of comminution, oxide of this character is not preferred.

The value of the oxide for this invention is best determined by the magnet. As a rule, a mass of oxide which is the most attracted by the magnet is the best.

The oxide of iron, which in the mass contains less oxygen than the peroxide, is indifferently termed the protoxide and the magnetic oxide; but, were this a strictly-correct chemical distinction, which is doubtful, yet as the mass is magnetic, and contains less oxygen than the per or sesquioxide (which is not available), it is preferred in this patent to speak of this oxide as magnetic protoxide of iron, which, independently of any considerations of theoretical composition, alike designates its most remarkable physical property, and, according to chemical nomenclature, sufficiently indicates the relation it bears to the peroxide, which is the only other oxide known to practice.

Having thus described the nature and character of the invention, it is to be understood that what is claimed in this patent is the purification of water and the other fluids hereinbefore mentioned, by means of the ferruginous oxide just described. Also, the same oxide, if used for the same purposes, alone or in combination with any other filtering media. Also, the same oxide for these purposes as found combined in the mineral or artificial substances herein named.

1938.—Hippolyte Lamy, of Paris, and 45, Essex Street, Strand, London, for "*An engine or apparatus for obtaining motive power by an improved method of applying steam, gas, or heated air.*" Patent dated July 11, 1857.

This invention consists of an engine the structure of which is based upon the human organization, and would be incomprehensible without the assistance of drawings; indeed, owing to the omission of some of the letters and figures in the original, some doubts arise as to the uses of the various parts.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED PATENTS.

3095.—Montague John Turner and Marcus William Turner, of Woodcote, in the co. of Surrey, Esqrs., for "*The improvement of conduit-pipes and tubes for sewers, drains, conduits, gas, and other purposes.*" Dec. 17, 1857.

3124.—William Bough, of 1, Jewin Crescent, Cripplegate, London, for "*Improvements in lamps and wicks for burning rosin and other oils and fluids, parts of which improvements are applicable to argand gas-burners.*" Dec. 19, 1857.

3136.—William Basford, of 15, Lowther Cottages, Liverpool Road, London, engineer, for "*Improvements in the manufacture of gas, and in retorts and other apparatus to be used therein.*" Dec. 21, 1857.

3178.—Thomas Spencer, analytical and consulting chemist, of 21, Southampton Place, or, as recently designated, 192, Euston Road, London, for "*Improvements in the purification of illuminating or lighting gas.*" Dec. 29, 1857.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED PATENTS.

2322.—Richard Johnson, of Blackburn, in the co. of Lancaster, gentleman, for "*Certain improvements in purifying and filtering water.*" Sept. 5, 1857.

2350.—Edward Lavender, of 30, Aston Street, Limehouse, in the co. of Middlesex, for "*An improvement in distilling products from coal.*" Sept. 9, 1857.

Legal Intelligence.

VICE-CHANCELLOR'S COURTS.—Tuesday, Jan. 12.

(Before Vice-Chancellor Stuart.)

SCOTT *v.* THE CORPORATION OF LIVERPOOL.

The Vice-Chancellor: In the case of *Scott v. the Corporation of Liverpool*, I have the advantage of knowing the opinion of Mr. Justice Erle, and I feel extremely embarrassed with the questions that arise in the present state of the suit with reference to equity from the conduct of the parties; but I have no difficulty in saying that the bill must be dismissed against the engineer (Mr. Hawksley); his counsel is not here, and I wish the plaintiff and the corporation to consider, before giving any formal judgment upon it, whether, inasmuch as no award has yet been made by the engineer, looking at the terms of the contract, it would not be the wisest course for the parties to have the cause stand over, with liberty to the engineer to make an award. I would rather make an order of that kind by consent of the parties, because I conceive a good deal of embarrassment may occur if the matter is to be disposed of upon the strict rules and principles of this court; but, considering that this great corporation are the defendants, that the works have been constructed, and that by the terms of the contract the award of an engineer was to be made, I should be much better pleased if the defendants would be disposed to enter into an arrangement that the cause should stand over until after the award is made. The case of fraud against the engineer entirely fails. I cannot see any ground to sustain the bill upon that, but the matter must receive some consideration. I only mention it now for the convenience of the counsel, for the defendants particularly—and your clients too, of course, Mr. Malins. Considering the nature of the case, I would much rather some arrangement were made, and I could direct the cause to stand over for a year, both the plaintiff and the defendants undertaking to proceed before the engineer in order to obtain an award. I will have it in the paper on some early day.

Mr. Bacon: In the meantime, I will communicate to my clients what your honour has now said. The corporation, as I understand their case, have always been most willing; therefore I do not think anything like dissent on their part would be expressed.

The Vice-Chancellor: I did not anticipate it; but at the same time, inasmuch as the case seems to me entirely to fail against the engineer as a case of fraud, you will be kind enough, Mr. Malins, to communicate to the solicitors of your clients, and perhaps upon this day week it can be put in the paper. I hope I have made myself intelligible as to the view I take of it.

Mr. Malins: I will communicate with my clients.

The Vice-Chancellor: I should be sorry for a case to be sent out of this court entirely upon a technical ground upon which it might be necessary to dispose of it.

(Before Vice-Chancellor Wood.)

RE THE SOUTH ESSEX GASLIGHT AND COKE COMPANY.

Mr. Shebbeare: Sir, in the matter of the South Essex Gas Company your honour made an order some little time since that upon the application of a petitioner, who was a creditor, he should be paid by two instalments, and in default of payment the company should be wound up. The Registrar has been drawing up the order, but his attention has been called to two clauses of the Act of the 19th and 20th Vic., c. 47, which refer to the subject. The 70th section is, that on the hearing of any petition presented by a creditor, the court may dismiss such petition with or without costs, or may make an order directing the company, by a day to be named, to pay to the creditor all moneys that may be due to him, or the court may, if it so thinks fit, on the hearing of the petition, make an order or decree for winding up the company in the first instance, or such other order as it deems just.

The Vice-Chancellor: One of the powers is to order payment to creditors.

Mr. Shebbeare: The court may make an order directing payment; but it does not say in default of payment the company should be wound up.

The Vice-Chancellor: It gives full power to make any order for payment and winding up; and I do not see why it should not be just to make it conditional.

Mr. Shebbeare: I should state that the next section says, that if at the expiration of the time named in the order such payment is not made, the court may thereupon make an order or decree for winding up the company.

The Vice-Chancellor: I do not think that prevents my doing it at once.

Mr. Shebbeare: Then, if your honour pleases, it will be in the terms we ask.

Mr. Roxburgh: This difficulty might arise. Suppose any sale took place under the winding-up order, it would be necessary to prove default made in payment.

The Vice-Chancellor: If you both wish it in that way I think the better course would be to let the drawing up of the order stand over till default is made.

Mr. Roxburgh: Default has been made.

The Vice-Chancellor: Then the better way will be to make an order for winding up at once.

Mr. Shebbeare: If your honour pleases. Then there will be payment of the costs.

The Vice-Chancellor: Do you mean personally, or out of the funds of the company?

Mr. Roxburgh: The costs of all parties will come out of the estate.

The Vice-Chancellor: What are they?

Mr. Shebbeare: The costs of all parties appearing upon this petition, and upon another which was irregularly presented.

The Vice-Chancellor: No; it will be the costs of this petition.

Mr. Shebbeare: If your honour pleases—all parties appearing.

WOOLWICH POLICE COURT.

Tuesday, Dec. 29.

THE SERIOUS CHARGE AGAINST A GAS MANAGER.

James Stark, gas-fitter, was again placed at the bar charged with stealing twenty ingots of lead and five lengths of 6-inch iron pipe, the property of the Crown, on or about the 17th of March last; and *Alexander Stark*, managing engineer of the Woolwich Consumers' Gas Company's works, was charged with feloniously receiving the same, knowing it to have been stolen.

Mr. Robinson, barrister, and Mr. Foreman, solicitor, to the war department, appeared on behalf of the prosecution, and Mr. Sparrow, solicitor, of Woolwich, for the prisoners.

The case excited extraordinary interest, a large number of the directors and shareholders of the gas company and others being in court. Mr. Robinson briefly opened the case, and all witnesses being directed to leave the court, the evidence given at the first hearing was read over. That evidence consisted only of the testimony given by two witnesses, Police Constable Sargent, 107 R, by whom the prisoners were taken into custody and the property found at Mr. Stark's premises on Parson's Hill, and a carman named Robert Warren, who had deposed that while Alexander

Stark was carrying out a contract for Government to lay pipes for the supply of gas and water to the new clothing store, he had by direction of the other prisoner, who was his brother's foreman, taken 20 pigs of lead, issued by the Government for the work in question, to the gas-works at Glass Yard, and subsequently to the house on Parson's Hill.

This witness was now recalled, and being examined by Mr. ROBINSON, said: I took 40 pigs of lead from the pontoon store in the Arsenal by direction of Joseph King, who I considered was my foreman. I took them to the clothing store at the Artillery Barracks, where I saw James Stark. He told me to put twenty pigs down there and take the other twenty down to the gas-yard. He covered the lead over with two old sacks. I took them, as ordered, to the gas-works in Glass Yard, High Street, and left them in a corner of the yard. Do not know what Alexander Stark was at the gas-works, but I was his servant. About a week or nine days afterwards I removed the pigs of lead again by order of Mr. Duck, time-keeper for Mr. Stark. Duck went with me, and carried them to Parson's Hill, where, by Duck's orders, I put them into a cellar. I afterwards took five 6-inch pipes from the clothing store direct to Mr. Stark's house on Parson's Hill by the order of James Stark, who helped me to put them into my cart.

Cross-examined by Mr. SPARROW: A pass was left at the gate for me to bring the lead out of the Arsenal. The police at the gate counted the pigs of lead in the cart. I have several times removed large quantities of lead from the Arsenal in a similar manner. The bags with which James Stark covered the 20 pigs in the cart were not the corn or nose-bags belonging to the cart, for I had left them inside the Arsenal. I cannot say whether they were put into the cart on purpose to cover the lead. I was not told where to put the lead when I got to the gas-works. I am sure Duck went with me when I took the lead to Parson's Hill. I never had any orders respecting the lead after I removed it from the clothing store. When I moved the pipes it was by the order of James Stark, who told me to put them under the gateway at the house on Parson's Hill. They were long pipes. When in Mr. Stark's employ I have several times been to London for materials which I have carted to the gas-works. I cannot remember that I have ever carted any lengths of pipe, similar to those I have mentioned, from Mr. Sales's wharf to the clothing store; I will not swear I have not, for I may have done so and forgotten it. I know the pipes I took to Parson's Hill were 6-inch pipes. When James Stark told me to remove them from the clothing store, he said, "Take those five 6-inch pipes down to the gas-works." I will swear that those were the words used. I have carted 4-inch, 8-inch, and 10-inch pipes at different times. When I took the five alluded to from the store there was no attempt at concealment. There were soldiers and other people about.

By Mr. ROBINSON: I know a 6-inch pipe when I see it.

By Mr. TRAILL: The bags put on the lead by James Stark quite covered it. I took notice of this, and can recollect it quite well, but I cannot say why I recollect it so particularly, I had no suspicion that anything was wrong. I carted both the lead and the pipes in the day time. In the cellar at Parson's Hill there was no other lead, but a few planks, small pipes, &c

By Mr. SPARROW: There might have been other lead there without my seeing it. Mr. Stark kept his horse at the house on Parson's Hill.

Andrew Macintosh, a young man, was then called and examined by Mr. ROBINSON. He said: I am a gas-fitter, and was in the employ of the Consumers' Gas Company in March last, at Glass-Yard Wharf. The prisoner, Alexander Stark, is employed as engineer to the company. I know his handwriting. I believe the signature to this contract to be his. (This contract, which was for the works carried out by Mr. Stark for the Government in March last, and which specified that the lead should be provided by the Government, was then handed to the magistrate by Mr. Robinson.) I recollect a quantity of lead being deposited in the yard in March by Mr. Warren. I told him in what spot to put it. There were about sixteen or twenty pigs. A few hours afterwards, Mr. Stark saw the lead, and told me to have them removed out of the way, his object being, as I conceived, to keep the yard clear. They were then put in the meter-house at the back of the large meter, which was the place where the lead was generally put. I remember an order being given to remove all Mr. Stark's property from the yard to his own premises. I know he had property distinct from that of the company, but cannot say that any particular place in the yard had been appropriated to receive it. It was by Mr. Stark's orders that the lead was put behind the meter. The meter was in a square building, which left some spare room round it, and it was here that the lead was put. It was not a light place, neither was it dark.

By Mr. SPARROW: Mr. Stark did not tell me to hide the lead. I think he said, "Put them out of sight." I thought he meant merely that they should be put out of the way of the traffic.

By Mr. TRAILL: I was in the office when the lead came. I had not expected any. Warren said he had brought it from the clothing store. Mr. Stark saw it about two or three hours after it arrived. Mr. Stark had a stock of lead on the premises for his own private purposes, and there was also a quantity of company's lead. I cannot recollect ever seeing any other lead of this form (brick shape) on the premises. I have seen it in several shapes. I have seen lead come from London for Mr. Stark. I cannot say whether the lead Warren brought was covered up or not. I was under the idea that the lead had been brought in remuneration for lead which Mr. Stark might have advanced during the works, for I thought it was Government lead, although no one told me so. I have heard rumours amongst the workmen in the yard that the lead was not honestly come by, but I did not believe it, not even when I coupled all the suspicious transactions together. I never mentioned the matter to Mr. Stark.

James Desmond, a young labouring man, was then called, and said, in examination by Mr. ROBINSON: I was taken into the employ of Mr. Stark about March last, having previously been employed by the Consumers' Gas Company. I recollect on one occasion being told by Joe King, the foreman, to take some lead from behind the meter to lay pipes at Little Heath, Charlton. My orders from King were to wrap the lead in sacks, and lay it in the bottom of the cart, covering it with coke and other things until I got clear of the town. King came to see it loaded. I had other labourers to assist me. I believe that the company was then at a stand-still for lead. I took away lead of the same description several times; I cannot say how much, but a great deal of the main was laid with it. I never saw either of the prisoners while I was using the lead, but on one occasion when King came up he saw some of the pigs of lead laying about the fire, and he then threatened to sack me, and told me to keep it out of sight. At another time we were laying the Government main on Woolwich Common, when we had to stand still for 12-inch pipes, and I was then sent down to the works with six pigs of the lead supplied by Government, some old handspikes and sacks being thrown over them. At the time of the illumination at the new schools on Plumstead Common, there were six pigs of lead laying opposite the building, which had not been used in laying the main for the gas. Mr. Alexander Stark told me to put them into the cart, and send them to the gas-works. I can't say where these pigs were brought from. The wooden plugs also for the pipes, which were turned for our use in the laboratory in the Arsenal, were not sent back to the department, but were put, by Mr. Stark's orders, into his temporary office in the Arsenal, and I saw no more of them. I have since seen some plugs of a similar description at Parson's Hill, but cannot say that they are the same. I am still in Mr. Stark's employ, and have been at work to-day. I have seen lead like that produced in the cellar of Mr. Stark's house. When the contract with the Government was finished, we carted the pipes out of the Arsenal, and I twice saw King put two of the Government iron 12-inch collars (or junction-pipes) between the other pipes, so that they could not be seen by the police at the gate; they were then carted to the water-works on Plumstead Common.

Mr. SPARROW objected to all this evidence being received, contending that it did not affect the charges made against the prisoners.

Mr. TRAILL, however, said he could not refuse to entertain the evidence if it had any relation to the property alleged to have been stolen.

The witness (who had given his evidence voluntarily) was then cross-examined by Mr. SPARROW and said: I am servant to Mr. Stark, or rather I was this morning. I have not received my discharge. I have seen a young man named Reeves, who, I believe, is a witness in this case; I saw him just now outside the court. I was first told to come here by Police Constable Sargent on Monday week. I had previously been summoned to the station at the Arsenal gates where I saw Reeves. After we left the station Reeves and I went to the Elephant and Castle, Beresford Square, and had some ale, bread, and cheese. We had no conversation whatever on this subject. Will swear positively to that. I was in the employ of the company before being engaged by Mr. Stark. I left the company one week before the contract commenced (the contract was signed to commence on the 19th of December, 1856) because Mr. Stark wanted to reduce my wages. I know Nicholas O'Bryan, but have had no conversation with him about the matter. He was with us at the Arsenal gates and at the Elephant and Castle.

By Mr. TRAILL: I cannot say why I did not previously tell any one what I knew of the matter. After I left the company's service, I went to work for a little while at the old gas company's works, and then returned and was employed by Mr. Stark.

By Mr. SPARROW: I had 12s. a-week when Mr. Stark wanted to reduce my wages.

Andrew Macintosh was recalled by Mr. ROBINSON, and in answer to his interrogatories said the lead brought to the gas-wharf by Warren, when packed in the meter-house was not covered over at the time. Some fire clay was put in the same place a few days afterwards which might perhaps have covered it. He also said he should be able to furnish all dates from memoranda which he kept.

Mr. TRAILL expressed an opinion that the evidence tended as much to implicate the man Joseph King as it did either of the prisoners. He wished him to be called to see if he could exonerate himself from the accusations which had been brought against him.

Mr. SPARROW said the man King was reserved as a material witness for the defence.

Mr. TRAILL said he should properly be a witness for the prosecution, and as such alone could he be heard.

Mr. SPARROW said, in that case, perhaps the prosecution would call him.

Mr. ROBINSON decidedly objected to doing so at the present stage of the proceedings.

During a conversation which ensued, Mr. TRAILL said what it was requisite for the defence to prove was, that the lead and other property was taken as an equivalent for some that had been advanced for the Government. If this could be proved, the accusation of felony would cease.

Alfred Duck, the time-keeper alluded to in the evidence of the carman Warren, was called at the request of the magistrate, and examined by him without being sworn. His statement was as follows:—When I told Warren to take the lead to the house at Parson's Hill, I did so entirely on my own idea, as I believed the pigs were the property of Mr. Stark. I ordered the removal of nothing else. I received no orders from any one respecting it, and therefore had no instructions to remove it. I did not go up to the house with the lead. I am certain I did not. The lead I found in the meter-room, which is quite a light place, and it might have been seen from the door-way.

Warren was recalled and re-sworn: He said he was positive that Duck went with him to Parson's Hill when he took the lead, and helped him to move it into the cellar.

Duck still said he was unable to recollect the circumstance. He did not see the lead put in the meter-house and did not know who put it there. No one had even spoken to him about it, and yet he had ordered it to be removed, because he thought it was Mr. Stark's. He had seen lead in somewhat similar shapes arrive from the manufacturer in London.

Mr. TRAILL said he thought it would be rather premature to call King, as, like Duck, he might probably attempt the impossibility of excusing both himself and his employers. He thought the prosecution must endeavour to make out their case without the assistance of these two men. He should now remand the charge, in order that time might be obtained by each party to prepare his case, and also that some steps might be taken with respect to King.

Mr. FOREMAN said he had just learned that King had been taken into custody, and Mr. Traill then ordered that he should be brought in and placed in the dock with the two other prisoners. He gave the name of *Joseph William King*, and said he resided at 87, High Street.

The evidence, so far as it affected King, was then read over.

The witness *Desmond* then said he had a few more words to say. While at work at the accumulating-house he saw Alfred Duck, who had Mr. Stark's stamp in his possession, marking all the timber and planks belonging to the Government which he saw lying about. He said to witness, "That's the way to do business, Jack." Witness replied, "I say, Alf, you're going the right way to get yourself into trouble." Duck said, "Ah, you're always frightened."

Mr. TRAILL remanded all the prisoners until Wednesday week, the 13th of January, stating that he should require bail in £50 for each, upon which three directors of the Consumers' Gas Company offered themselves as bail, and were accepted.

WEDNESDAY, JAN. 13.

The prisoners were again placed at the bar this day before Mr. Traill.

Mr. ROBINSON, barrister, and Mr. FOREMAN, solicitor, appeared to prosecute, and Mr. Serjeant BALLANTINE, instructed by Mr. SPARROW, solicitor, appeared for the prisoners.

Mr. TRAILL suggested that the previous evidence should be read over,

but the prisoners' counsel said that he had sufficiently mastered the case to enable him to do without it.

Nicholas O'Brian, examined by Mr. ROBINSON, deposed: I live in Beresford Street, Woolwich, and in March last I was in the service of Alexander Stark, engaged in laying gas and water mains at the clothing department. I remember Warren bringing some ingots of lead there: a portion—I cannot say how much—was left; the remainder was ordered by James Stark to be taken to the gas-works without being unloaded. Joseph King was present at the time; he followed the cart a few yards behind, and stood close to it till the things were taken out. I did not see him do anything. Stark threw two old sacks over the lead in the cart. When it went away King returned to the Arsenal, to the best of my knowledge. When the job at the clothing-store was finished, I left two pigs of lead in the cutting-shop, in charge of John Reeves. James Stark was not present at that time; he came there a few minutes afterwards, but his attention was not called by me to the pigs. I have laid some six-inch water-pipes at the clothing-store since then. I have not seen the pipes found at Parson's Hill. I recollect, somewhere about the end of February, using such pigs of lead as those now produced in laying some gas-mains of the company up by the North Arch, Artillery Place. I carried one of them there on my shoulder.

Mr. FOREMAN: By whose direction?

Mr. Serjeant BALLANTINE: We say we have at times used Government stores upon other works.

Witness: I used them by direction of King. He helped me in doing the job with them. I took those particular pigs, in the first instance, because there were no others. They were lying in the street, on the Government works in Beresford Square.

By Mr. TRAILL: I cannot say how many pigs of lead were used in the Government job; they were brought there at different times, and when the job was completed there were two left. I cannot say that these formed part of the lead brought in by King, and which was ordered by Stark to Glass Yard. The two sacks were spread over the load, as I thought at the time, to hide the lead. I cannot say whether they completely covered it.

John Reeves deposed: I live at 26, Upper Burrage Place, Plumstead, and am a gas-fitter by trade. I was employed by Alexander Stark in March last, at the clothing-store, fitting up gas in company with James Stark. On the 17th of March last I recollect that Warren brought up a load of lead to the store. He was followed by Joseph King. At the time he arrived, James Stark and I, and Nicholas O'Brian were there, with, perhaps, a labourer or two. A small portion of the lead was taken out of the cart, and then James Stark took two sacks in which coke had been brought up for the use of the men, threw them over the remainder, and then Warren went away with it. I was, perhaps, 20 or 30 yards off at the time, and did not hear directions given by any one, but I saw plainly from where I was that there was lead left in the cart. I cannot say for a certainty whether the bags entirely covered the lead, but I think they did, or nearly so, as they were large bags. The cart went down the hill again towards the Arsenal, the same way as it came up. That way also leads to the gas-works. I went down to the gas-works the same day after some pipes, and I saw the lead at the bottom of the stairs of the meter-house. I believe it to be the same lead. It was at the foot of the fitters'-shop stairs. I cannot tell how many pigs there were, as I did not count them, but perhaps there might be 20 or 30. There was a good lot of them. I recollect assisting to load some 6-inch pipes at the clothing-store, by James Stark's direction, along with Warren. There might have been other people about at the time, but no one else in Mr. Stark's employ. There were five 6-inch pipes. I and Warren and James Stark went to Parson's Hill with them. I walked by the side of the truck, and assisted to unload them when we got there. James Stark also assisted. We put them up at one side of the shed, used as a store by Alexander Stark. I do not know that James Stark said anything else at the time, only that we were to pack them up safe at the side, and put some large valves which belonged to him over them. He did not give any reason for saying so. The effect of placing the valves upon them was that they were entirely covered except at one end. The valves were lying in the same place; we moved them away, put the pipes there, and then placed the valves over them. I remember on one occasion seeing Michael Sullivan with two pigs of lead, which had been put into a sack and rolled up. He was carrying them on his shoulder. I could not see the pigs, as they were covered up, and I only judged from what he told me. He was coming from the clothing-store, and going along by the cadets' barracks. Previously to that O'Brian had left two pigs of lead in my charge. I had seen them safe about three quarters of an hour before I met Sullivan, and when I went there immediately afterwards I missed them.

Cross-examined by Mr. Serjeant BALLANTINE: I am not doing anything at present. I have been out of employ a month, and have been living on what I had saved before. I was in Stark's employment, and was dismissed. He did not decline to give me a character as a workman. I swear that. He declined to give me a character as having served my time to him, but he said he would give me a character for being honest, industrious, and sober. Before I went into his employ I was a gentleman's servant. I am now living on what I saved in that capacity.

By Mr. TRAILL: I was in Stark's employ until a month ago last Saturday.

By Mr. Serjeant BALLANTINE: I did not say that I would be revenged on him for turning me away—nothing of the kind. I never made any angry observation about being turned away, nor did I give any information which led to these proceedings being taken. A policeman came to me and read part of a letter, but before that I had made no communication to any one. The things that I have been speaking about were publicly talked over by all the men at the works; the matter was known to them all. I remember being at the Elephant and Castle in Woolwich on the 21st of December. O'Brian was there, and there were several men in the tap-room. I cannot say whether we talked over this matter; we might have done so. I will not say that we did not. I did not say that I would put Stark where he would not be heard of for years. I cannot say for certainty whether or not any remark was made about him. I do not know whether I said that I was going to be a witness in this case, or that I should be well paid for coming. I might have done so, but I have forgotten it. I do not believe that I did. I mean to say that I remember the pigs of lead being covered over because that was a matter that was talked about, but I do not remember about this. I do not know that I am to be paid, and I cannot tell whether or not I said I expected I should be. I did not say that if young Jim Stark did not run the country I would make him drown himself. I might have said something abut Jim Stark running away. I do not know what I said. I believe some one said he would run away, and I said I did not think he would. I swear that I said nothing about his drowning himself. I did not say that if the Starks were committed I was sure to be paid. I know a person of the name of Thomas. He is a gentleman, living in Warren Lane. I did not know him when he was connected with the gas company. I have spoken to him on this matter. I met him first in the street, told him I was out of work at that time, and asked him to recommend me to a place. I do not know exactly when that was. It was within the last month, but I cannot say for certainty whether it was before I had given any information respecting this charge. The sergeant of police first spoke to me about it on Friday, Dec. 17. I do not know whether it was before or after I had spoken to Mr. Thomas. I will not swear whether or no I told him that a policeman had been to me. About a fortnight ago I went to Mr. Thomas's house to ask him about recommending me to a place. We had two or three words then about Mr. Stark's affair. He said it was a bad job, and asked me what I thought about it. I said I did not know what to think. He has not got me a place, nor has he promised to get me one. I have been to his house at other times, but he was not at home.

Re-examined by Mr. ROBINSON: I was discharged by Alexander Stark. Mr. Thomas is a gentleman who is not connected with either the gas or water company that I am aware of. I have known him a long time. I think he knows the Starks. Alexander Stark wished to lower my wages, and I said I would not take less, so he discharged me. He said he would do what he could for me. We are on very good terms; and since the first hearing of this case, Joseph King came to me to say that Mr. and Mrs. Stark invited me to the supper which they were going to give to their men.

Mr. ROBINSON: What was the nature of the conversation which you say took place amongst the men about this affair? What men do you mean?

Witness: The fitters and the smith, as well as James Stark himself—all who were in the service of Alexander Stark.

Mr. TRAILL: I do not see how you will benefit your case by asking that question.

Mr. ROBINSON: I think it is necessary, because my learned friend has intimated that, as it was a matter of notoriety, therefore there was nothing wrong about it. (To witness.) What was the nature of the conversation?

Witness: That they thought, from the way in which the pipes were taken away, they were stolen.

Mr. TRAILL: I think you had better not go further. (To witness.) You say you noticed King come up with the cart, or that shortly afterwards he came up; did you notice whether he remained during the time the lead was being unloaded?

Witness: He did. I do not know whether he took any part in unloading. The sacks were put into the cart by James Stark. I cannot say anything more positive than I have done as to the conversation at the Elephant and Castle. I have said several times that I should expect to be paid for coming here. I might very likely have said so on that occasion, though I had not been engaged to come at that time. I could not have said that I should be well paid.

Mr. THOMAS said, as his name had been mentioned, he hoped the magistrate would allow him to say a word.

Mr. TRAILL said he could not allow it, unless he was called as a witness.

Mr. THOMAS asked Mr. Robinson to call him.

Mr. ROBINSON declined.

Mr. Serjeant BALLANTINE said his friend was not inclined to purchase a pig in a poke. (Laughter.)

Mr. TRAILL said, when the case was over he would hear anything Mr. Thomas might wish to say.

Michael Sullivan, examined by Mr. ROBINSON, said: I am a labouring man, and reside in Warren Lane. I was in the employ of Alexander Stark in March last. I had been working with James Stark at the clothing-store. I recollect meeting Reeves on one occasion when I had two pieces of lead in a sack on my shoulder. James Stark gave me those pieces; they were folded up in the inside of a sack. He was working at the clothing-store then, and he told me to take those two pieces of lead down to the gas-works. He told me not to let any one see them, and to give them up to Nix, the foreman at the works. He folded them up in the sack himself. I saw him do it. He put the sack down upon the ground, folded the pigs of lead in it, and tied it up with a piece of yarn.

Cross-examined by Mr. Serjeant BALLANTINE: I did not mention this matter to any one until Sergeant Thompson sent for me. He had a man to watch for me as I went in, who told me that Mr. Thompson wanted me, and I went up to him to see what he wanted.

Mr. TRAILL: How did Sergeant Thompson know that you knew anything about this matter?

Witness: Some one must have told him.

Mr. Serjeant BALLANTINE: Then you must have told some one about it?

Witness: Yes, I told John Reeves two or three days before Christmas.

Cross-examination continued: I met Reeves in the street, and he asked me whether they were two pigs of lead that I had in the sack. I told him they were. I did not tell him anything else, and we then parted. I swear that we did not go to a public house together, and I have not seen him since till I came here. He did not tell me what he was to get for this job. I have not been told what I am to get. I wish some one would pay me for all the time occupied in coming up here.

By Mr. TRAILL: When I met Reeves at the time I had the lead on my shoulder we had no conversation.

Mr. ROBINSON said that was all the evidence which he was prepared at the moment to lay before the bench with respect to the pigs, but he was in a position to produce some important evidence in reference to the plugs, and should trace them to Parson's Hill.

William Henry Kennedy was then called, and deposed: I live at No. 4, Union Row, Woolwich, and am a clerk in the employment of the Plumstead, Woolwich, and Charlton Water-Works Company. I have been in their service since June last. Previous to that I was in the service of Stark and of the gas company. I was so in April and May last. The note produced is in my handwriting. I wrote it by Mr. Alexander Stark's direction on, I think, the 14th of December. [Note handed to witness.] It was written on the day it bears date. Mr. Stark was not present when I wrote it. When I had written it I delivered it to Mr. Davidson. I had no directions about that. I delivered it the same day.

The CLERK read the letter. It was addressed to "Mr. Davidson, Arsenal, Woolwich," and was in the words following:—"You will receive, per Richards, the wood plugs which I had on loan from you, and for the use of which I am obliged." Signed, "for Alexander Stark, W. H. Kennedy."

Examination resumed: I was down at the gas-works when the directions were given. I always go down every day to see Mr. Stark and assist him.

Cross-examined by Mr. BALLANTINE: Mr Davidson is alive and well at the present time as far as I know. During the time I was in Stark's employ I remember his using 6-inch pipes of his own in the Government works. Mr. Allen was a person employed by the Government; he was in the engineer's office. He has given me orders about Mr. Stark using his own materials.

Mr. ROBINSON objected to this line of cross-examination.

Mr. TRAILL (to witness): Were you in Mr. Stark's employment, and acting for him, at the time the communication was made by Mr. Allen?

Witness: Yes; I was laying mains in the composition building as his servant.

Cross-examination resumed: I have used Mr. Stark's materials upon that building. I used one casting there. I believe that was done with the knowledge of Mr. Allen. The reason it was done was that there was not anything of the kind in the Arsenal, and that part of the work had been left standing for above a month. Mr. Allen had been round, and I had seen him on the works. I do not know whether I told him that I had used Mr. Stark's materials. The work to be done on the Government storehouse was frequently behind hand through the want of materials, and we had to shift the gangs of men employed in consequence.

Mr. Serjeant BALLANTINE: I believe I am right in supposing it to be in evidence that the Government materials could not be removed from the storehouse without orders?

Mr. TRAILL: Yes; and there is an order for removing everything except the four iron collars, which were not perceived by the policeman, in consequence of the way in which they were put upon the truck. With regard to the 20 ingots of lead there was an order which they contrived to get, whether legitimately or not is not stated.

Re-examined by Mr. ROBINSON: Witness said, I only superintended the laying of mains in one place. The casting belonging to Mr. Stark was used in the bend. If a policeman went with me to the building I could point out the place where it was used. I have seen some 6-inch pipes of Mr. Stark's used there, and can point out the spot. On my own knowledge I state that the work has been stopped for want of materials. I have had to wait myself in the composition building. We were laying 6-inch and 4-inch pipes there. We had to wait for a branch used in connecting.

By Mr. TRAILL; It was a pipe with a branch to it. That was the only work I did personally; but I knew that the men were waiting when they were in Green's End. I saw them waiting. They had the ground open to lay pipes, and Mr. Barnett, the surveyor of the parish, complained of it to King while I was present. I remember another occasion, which was at the branch main at the corner of the gun foundry. I do not know what month it was in, but it was between January and March. Several other instances were reported, but I cannot speak of them from personal knowledge. I cannot say how many of Mr. Stark's pipes were laid down, but a great number of castings belonging to him went in. A number of 6-inch pipes were taken from the Plumstead Road.

Mr. TRAILL: Do you know of any large number being taken into the Arsenal?

Witness: Those were used outside in Green's End.

Mr. TRAILL: How many?

Witness: I should say about 50. He had them off the water-works there.

By Mr. ROBINSON: I believe Mr. Allen is not in the Government service now.

By Mr. TRAILL: I once went to Mr. Bell with a message from Mr. Stark about the pipes, but not to specify such a fact as that I was about to use Mr. Stark's old pipes.

Mr. TRAILL: It is quite possible, I suppose, to identify the Government pipes, because they would have the broad arrow upon them.

Mr. ROBINSON: I believe not; but there will be no great difficulty, because they are heavier pipes.

Mr. TRAILL (to witness): Do you know whether the pipes were of uniform size and weight?

Witness: No, they were not; some of them had to be chipped in order to enter the sockets. I cannot say whether they were of uniform thickness. Mr. Stark supplied heavy pipes

Mr. TRAILL: You say you have no recollection of having had communications with anyone else except Mr. Allen upon the subject of using Mr. Stark's pipes in the Government works?

Witness: Mr. Stark had a letter from Mr. Bell, which I have seen. I had no communication with Mr. Bell myself upon the subject.

Mr. ROBINSON: Bell and Murray have both left, and we shall tell the conditions under which they left. We can also tell the quantity of pipe and lead used.

Mr. TRAILL: It seems by the evidence of witnesses that there must have been 18 pigs of lead used at the proving-yard, because only 2 remain.

Mr. ROBINSON: That was only on one occasion.

Mr. TRAILL: Was the work executed sufficient to absorb the whole?

Mr ROBINSON: I do not know; but I can show how much pipe and lead were applied to the works in the Government buildings, and how much Mr. Stark has had out. If it is suggested that he has only had enough to compensate himself, I can show how much he has had beyond what is necessary.

Mr. TRAILL: That will make another case of it entirely.

Mr. ROBINSON: No, it is exactly the same case. I say he has a quantity of lead in his possession not accounted for.

Mr. TRAILL: The quantity may be so glaring as to constitute a case for inquiry; otherwise, it is a question whether he has charged a larger expenditure of his own materials upon the works than what actually took place. At present you have established this, that there was a consciousness on the part of these persons that they were dealing with a thing about which they must be careful; and, if the witnesses are to be believed, this is not explained favourably to the parties charged. The removal of the lead, and the directions given about placing it out of sight behind the gas-meter; the concealment of the pipes at Parson's Hill by removing the valves and putting them on the top; and the cautious manner in which these materials were used in the works of the gas company—all these things lay the foundation for a charge of dishonest practices, and would strongly reflect upon the conduct of the parties concerned. But the whole is based upon the supposition of such gross negligence of those who have the charge of the Government stores, that I cannot at present see my way to a criminal prosecution. There is one thing quite clear, that if such a system is now going on, it is impossible to say that the time bestowed upon this inquiry is not well bestowed, if we can probe the evil to the bottom, whether it results in the committal of the prisoners on a criminal charge or an inquiry elsewhere. I think the solicitor to the Ordnance must go on with the matter till he detects where the delinquency is, and is able to put a stop to it.

Mr. ROBINSON: The inquiry is now going on.

Mr. TRAILL: In reference to this case, I think the better way would be to make a long adjournment, and let the result depend very much upon the instructions which the solicitor to the Ordnance receives from head quarters.

The case was then formally adjourned for four weeks, the same bail being taken for the appearance of the defendants as on the former occasions.

Miscellaneous News.

METROPOLITAN BOARD OF WORKS.

A Special Meeting of the Board was held at Guildhall on Monday the 11th of January, in pursuance of the following requisition:—

We, the undersigned, being members of the Metropolitan Board of Works, do hereby require you to convene a special meeting of the board, to be held on Monday, the 11th instant, for the following object, viz.:—

To take into consideration the present condition and position of the schemes for the main and intercepting drainage of the metropolis, and to determine what, if any, steps the board may deem it advisable to take in relation thereto.

Dated Jan. 1, 1858.

ALF. R. BRISTOW, THOMAS D'IFFANGER,
WILLIAM CARPMAEL, J. A. NICHOLAY,
W. E. SNOW, HENRY BURSLEM,
JOHN SAVAGE, BENJAMIN DIXON,
PHILLIP CRELLIN, W. A. H. HOWS.

To the Clerk, &c.

The CHAIRMAN said a communication had just been received from Messrs. Hawksley, Bidder, and Bazalgette on the subject of the further information which had been transmitted by the Government referees.

The CLERK read the letter, as follows:—

METROPOLITAN MAIN DRAINAGE.

24, *Great George Street, Westminster, Jan.* 9, 1858.

Sir,—We beg to acknowledge the receipt of the further information rendered by the Government engineers to the First Commissioner of Her Majesty's Board of Works. We have, however, to explain that the information so rendered relates almost exclusively to new designs for constructing and working the outfall sewers, and does not afford the particulars of the plans referred to our consideration requested in the communication made by us to your board on the 5th of December last.

(Signed) G. W. PIDDER,
T. HAWKSLEY,
J. W. BAZALGETTE.

Mr. CARPMAEL requested that the communication from the First Commissioner transmitting the further communication from the referee engineers might be read.

The CLERK accordingly read the following letter, &c.:—

(COPY.)

Office of Works, &c., Jan. 7, 1858.

Sir,—With reference to my letter to you of the 19th ult., stating that the First Commissioner of Her Majesty's Works, &c., had desired the engineers to whom he referred the plan submitted to him by the Metropolitan Board of Works for the main drainage of the metropolis, to supply him with the particulars and plans mentioned in your letter of the 24th of November and 5th ult., and that he would lose no time after the receipt of those particulars and plans in forwarding them to the Metropolitan Board, I am directed by the First Commissioner to send you herewith a copy of a letter which he has this day received from Captain Douglas Galton and Mr. Simpson, and also the plans and other documents which accompanied it, and to request that you will lay the same before the Metropolitan Board.

I am, Sir, your obedient servant
ALFRED AUSTIN, Secretary.

E. H. Woolrych, Esq.

29, *Great George Street, Westminster, Jan.* 7, 1858.

Sir,—We have the honour to transmit to you the accompanying additional information relative to the plan for the drainage of the metropolis suggested by us, viz.:—

1. Longitudinal and cross sections of the outfall channels.
2. A mathematical analysis by Mr. Pole of the laws which govern the flow of water in tidal channels.
3. Geological map of the estuary of the Thames by Mr. Prestwich, and description of the lines of the outfall channels and borings.
4. Description of the manner in which it is proposed that streams interfered with by the outfall channels should be dealt with.
5. General description of positions of reservoirs.
6. Estimates of outfall channels.

It will be perceived that the cross sections differ from those sent in on the 21st of November. This difference is caused partly by a slight modification in the form of the channels, but it is due mainly to the fact that the diagrams to which the cross sections, then sent in, refer, were calculated in error for too large a storm flow.

The actual storm flow to be provided for is 1287 cubic feet per second on the north side, and 1152 cubic feet per second on the south side of the Thames; the conditions of the flow of sewerage in the channels, according to the sections now sent, are more favourable to its discharge than those obtained from the sections upon which the former diagrams were calculated.

In consequence of the outfall channels having been covered, and the depth having been increased, it has been deemed advisable to deviate the lines laterally in some places to a small extent.

With respect to the question whether we recommend that the tide should be allowed to enter, or should be excluded from the outfall channels at the lower end, we have to state that we consider that gates should be provided at the lower end, and we think it would probably be found advisable generally to keep the gates closed on the flood tide; but that it might be found occasionally desirable to admit the tide.

We did not feel justified in incurring the expense of obtaining a detailed valuation of the lands, &c., intended to be passed through; the course we pursued was to ascertain the extent of land required, and to put such a price upon it as would, in our opinion, be sufficient to cover the probable expenditure under this item.

As regards the intercepting sewers within the metropolis, concerning which the Metropolitan Board of Works request to be supplied with information as detailed as that supplied by them to enable you to consider whether their plan was one of which you could approve, we have to observe that our first report indicated generally the lines of sewers which, after a close examination of the metropolitan area, we recommended should be adopted; and we satisfied ourselves by a careful process of calculation that the approximate cost of these sewers would be £2,293,000; but we did not make out such detailed drawings, nor did we frame such detailed estimates for them, as the Metropolitan Board of Works have asked for. We are prepared to do this if you require it; but the positions and details of these sewers are entirely dependent upon the level to which it is proposed that the sewerage should gravitate within the metropolis; and the metropolitan board of Works have, both in their letter of the 31st of October, and through their president and engineer at the interview which they had with you on the 5th of November, distinctly objected to our proposal to remove as large a portion of sewerage as is possible by gravitation alone, without having recourse to artificial means.

Until, therefore, this main principle of our plan shall have been admitted, we are of opinion that it would be a useless expenditure of labour to furnish any further details respecting the intercepting sewers within the metropolis.

We have the honour to be, Sir, your most obedient servants,

(Signed) DOUGLAS GALTON,
JAMES SIMPSON.

The Right Hon. Sir Benjamin Hall, M.P.,
First Commissioner of Her Majesty's Works.

Mr. CARPMAEL said he had given notice of his intention to move—"That the Board not having received the plans, sections, and information applied for in the communications addressed to the First Commissioner of Her Majesty's Works, on the 24th November and 5th December last, and to his referee engineers, on the following dates, viz., the 8th, 16th, 28th, and 29th September last:—It is resolved—That this board regretting the delay which has already taken place, and feeling most anxious that no further time should be lost in respect to this important question, Messrs. Bidder, Hawksley, and Bazalgette, be instructed to make their report to the board with all practical speed, and without waiting for the further plans, sections, and information above referred to." Since giving that notice, however, circumstances had somewhat altered, and he would now ask permission of the board so far to modify the terms of the motion as to make it accord with the position in which they were now placed. What he now proposed to move was—"That this board regretting that the Government engineers

appointed on the 31st December, 1856, have not afforded the essential particulars applied for, respecting their recommendations, and that they should have again found it necessary to vary their schemes, refer to Messrs. Bidder, Hawksley, and Bazalgette, the papers transmitted by the First Commissioner of Her Majesty's Works, &c., and request those gentlemen to report to the board with all practicable speed." His object was to put an end to the great delay which had taken place, and to obtain from the referees of the Metropolitan Board a report on the main drainage without any regard to the plans of the Government engineers. The delay which they had been subjected to was so serious that the board would be wanting in the performance of their duty if they did not now determine that there should be an end to it. He reminded them that they had just entered upon the third year of their existence, and that one of the two years past had been entirely lost—utterly wasted, so far as the great question of the main drainage of the metropolis was concerned. (Hear, hear.) In following up the inquiry upon this subject they must keep in mind what it was that the statute required the Metropolitan Board to do, and what duty it imposed upon another tribunal. This board came into existence on the 1st of January 1856, and in June of that year, notwithstanding the multitude of other business they had to transact, they did, by a large majority, come to a resolution as to the principles which should guide them in carrying out a scheme of intercepting sewerage for the metropolis. He was much gratified in being able to say that though those principles had been before the world for the last 18 months, there had not been, up to the present moment, a single objection by any engineer as to the plan itself, whilst on the other hand, a large number of the very highest authorities were in favour of it. (Hear, hear.) Whether the board had carried out their principles to the utmost limit to which they were capable of affording benefit, was a question now before those gentlemen to whom they had referred their plan; but, so far as his judgment went, he had no hesitation in saying that he believed it would be found that the board had not only accepted a right principle to guide them, but had carried it out as far as any benefit could be derived from it. The 135th section of the Metropolitan Local Management Act required the board to execute all works necessary, according to their conviction, to prevent all or any portion of the sewerage from flowing into the Thames within the metropolis; but it prohibited them from carrying out, or even commencing the execution of such works, till their plans had been laid, with the accompanying estimates, before the Commissioners of Her Majesty's Works, who, by the next section, were authorized to approve the same. But it should be borne in mind, that neither the 136th section of the statute, nor any other, gave power to the Commissioners of Her Majesty's Works to originate plans to be laid before this board. (Hear, hear.) This was the more important to be borne in mind, because, from the course pursued by the right honourable baronet at the head of that department, the whole of the 12 months last past had been wasted. (Hear, hear.) There was some little delay originally, between June, 1856, and the time of finally agreeing what should be the plan adopted, owing to a diversity of opinion as to the precise point of outfall, but the board, by a large majority, ultimately resolved that it would be wise to go to Parliament, to be relieved from the operation of a portion of the 135th section of the Act, because it was found that there were large portions of marsh land on the north and south sides of the river, between Greenwich and Woolwich, which might be made available for the purposes of outfall; especially as, in an engineering point of view, they were the most eligible that could be obtained on the banks of the Thames. But on the 22nd December, 1856, the plans were carried up to Sir B. Hall, and they were accepted, so far as the legal requirements were concerned, by the First Commissioner. On the 31st of that month, Sir Benjamin referred those plans to three gentlemen, Messrs. Simpson, Blackwell, and Captain Galton, requiring them to report to him thereon. That the First Commissioner should have taken that course no one could be surprised, in fact nothing could have been more discreet, nothing more satisfactory than that he should decline on his own mere motion to decide whether that was a proper scheme on which to exercise his veto or not. Had he stopped there—(hear, hear)—no reasonable objection could have been raised to the course which he pursued. (Hear, hear.) But he did not stop there, for he instructed those engineers, in addition to the investigation of the plans of the board, to originate a plan themselves: "If," said his secretary in his letter to them, "you can devise any other scheme which may in your opinion be better calculated to carry out the object in view, he (the First Commissioner) requests that you will, in your report, set forth that scheme, in order that he may lay it before the Metropolitan Board for their consideration." This was clearly stepping beyond the bounds of his duty, and setting at nought his own statute. (Hear, hear.) From that one act the whole of the delay, from the 31st of December, 1856, to the present time, had arisen. The referee engineers, on the 31st of July, 1857, sent up a partial report to this board through the First Commissioner. That report did not contain the most essential feature, viz., the appendices and sections, and even if it had done so the Metropolitan Board, as a board, had expended their powers when they laid their own plan before Sir B. Hall, and were not in a position to entertain any new scheme until the First Commissioner had exercised his veto in respect of it. (Hear.) When, however, the report of the referees came under discussion, he (Mr. Carpmael) ventured to state most boldly that it was altogether based on a fallacy, for though the appendices and sections were wanting, he was able to see most clearly that what the referees proposed to do was utterly impracticable—viz., to keep a preponderating head of water at the upper end of their sewers, to be obtained out of the Thames at high tide. That, as he then informed the board, was now felt by the referees to be impracticable, and they had accordingly abandoned the idea. On the 24th of September, 1857, this board received the perfected report, with appendices and sections, the First Commissioner intimating, in the long letter which accompanied them, that he did not approve the plan of the board with the outfall at B*, without assigning any reason for its rejection. On that day, therefore, the board was repossessed of its powers under the statute and which had been kept in abeyance during the period that their plan was before the First Commissioner. Now, he was quite prepared to admit that if the scheme propounded by the referee engineers had been of such high merit, of such commanding utility, that it must force itself upon the approbation of the world, this board might have overlooked the usurpation of the First Commissioner of Works in taking out of this board the duty and the power of originating a plan; but when they found that it was based upon a fallacy, and that the premises were so untenable that the referees had themselves turned their backs upon their own child—that not a vestige of the original scheme now remained—he felt that the board might with propriety complain of the time which had been lost since their plan was laid before the First Commissioner. In order to show the correctness of the remark that the original plan had been abandoned, he would turn for a moment to what the reputed organ of the First Commissioner said upon the subject. In the *Observer* of the 26th December occurred this passage—"The referees prepared a plan which has been practically rejected by the board, and *which certainly has been generally condemned.*" This was the language of a journal which professed to represent the opinions of the First Commissioner himself. It went on to say—"but that was the fault of the referees and not of the First Commissioner, who was not in the slightest way responsible for it." (Laughter.) Now, no one supposed that Sir B. Hall was responsible for the fallacies on which the referees he selected based their report, but every one must condemn the line of conduct pursued by the First Commissioner in having caused the waste of time by asking those engineers to do that which he was not called upon by the statute to do, and in which they had so signally failed. The truth was this: Sir B. Hall imagined that he, by the aid of his engineers, could produce such a transcendent plan as to put that of the Metropolitan Board to shame, and secure for himself and his board the approbation of the public. But a change had come over the whole matter: the plans of the Metropolitan Board had been approved in principle, even by the Government engineers, and the only fault that had ever been found with them was one of detail only. And what, after all, was the importance to be attached to the fault found with them by the referees, when their own was so faulty that they could no longer continue to father their child? The first plan which they propounded was to have an open cutting, or ditch, from Woolwich to Sea Reach, with a series of inverted syphons throughout its course. When this was objected to, they found out that it was practicable to cover it over at a cost of £500,000, though they had prepared no plans for doing so; and this board had not to this day seen the sections of the original scheme proposed by them. This was, however, abandoned, and a second plan proposed, in which the outfall channels were covered over from the Ravensbourne on the one side, and the Lea on the other; but no plans of a practical character were prepared by the referees. All that they did was this: they took a map of the country, and drew a line from Woolwich on the one side, and Barking on the other, down to Sea Reach. They then took a section of the country and drew another single line, showing the depth at six inches per mile that the sewer was to fall; and nothing but these two lines represented the reduction of their works into form. They submitted to Mr. Pole a proposition in order to ascertain the laws which govern the rise and fall of water in tidal canals, as compared with tidal rivers, for they had not the courage—he could not suppose they had not the ability—to make a calculation for themselves. These were the only documents they had forwarded to the board; these were the only practical materials they could supply to render their strange scheme intelligible. In November they sent these diagram sketches, and if these were compared with the practical transverse sections just received, it would be found that they had no relation to each other, and that they had altered the dimension and the form of every sewer from the first to the last. The board had now their third plan before them, so far as it related to taking the sewerage from the Ravensbourne and the Lea; but they had no plan whatever of the work to be done within the metropolis, and which was estimated to cost between two and three millions. Surely the great work of the drainage of London was not to be delayed in this way, and the functions of this board destroyed by the usurpations of Sir B. Hall and the absurd plans of his engineers! He would now refer to the plans just received from the First Commissioner. Would it be believed that it was now proposed, according to a marginal note in red ink in the plan, that the Lea river should be crossed with four cast-iron tubes, each of ten feet diameter, "the cost of which (as the note itself stated) was not contained in the estimate?" It seemed as though it were an after-thought, "How shall we cross the Lea?" and "What will it cost?" Now the Lea, where it was intended to cross, was very wide, and an exceedingly difficult river to deal with under any circumstances. To propose, therefore, to cross it with four 10-feet iron tubes was not only undesirable in an engineering point of view, but would involve a very considerable cost upon the ratepayers. He contended that the referees had not dealt with the subject in a practical, business-like way, and that on that ground the delay was to be regretted. Their estimates, such as they were, had been drawn up in a hasty and most strange manner, and no faith could be placed in them. It was a very remarkable thing that, notwithstanding the various changes that had been made in their proposals, and though their first scheme would require two or three times as much brickwork as the last, the estimates did not vary so much as a single penny. (Hear, hear.) It would have been better and more honourable if, after they found that they had committed an error in the outset by proposing to drain too large an area by gravitation, they had admitted the fallacy; but, instead of doing so, they had substituted plan after plan, in hopes of getting rid of the difficulty, which, however, had led them into a still deeper mess; and their last was as fallacious as any of the others. He would only add one word more. This board had placed its ban upon open sewers, and the referees had admitted that they were undesirable, yet, strange to say, the end of each of the outfall sewers, as now proposed by them, was to be so constructed that, for three miles on one side, and three miles and a half on the other, there would be a large open cutting, 35 feet deep, 100 feet wide, and coming up to within a mile and a half of one of the most densely-populated towns on the banks of the Thames between London and the sea—the town of Gravesend. These large stagnant pools—for there were to be gates at the end which would be kept closed during the whole period of the rising of the tide—would contain the festering sewerage matter for some 12 or 14 hours longer than the board proposed to pour it in by their plan, and would emit vapours and create a fearful nuisance in the locality. The engineer of the board had intimated to the referees that by their former plan they would make 18 miles of sewerage to gain only 9, and therefore they now proposed to discharge only at and after high tide; but, as a large part of that would be immediately washed up the river, he did not see that they had benefited themselves much. Under these circumstances, he asked the board to come to a resolution such as he had read.

Mr. SAVAGE seconded the motion.

Mr. HOWS moved, as an amendment, that the further consideration of any plan for the intercepting main drainage of the metropolis be deferred until Parliament had determined whether any steps should be taken to carry out the recommendations recently made to the First Commissioner of Her Majesty's Works by Mr. Goldsworthy Gurney.

The CHAIRMAN said he felt a difficulty in receiving such an amendment. The Metropolitan Board of Works had had certain powers conferred upon them by Parliament for carrying out the main drainage of London, and it was their duty to act upon those powers until Parliament interposed and gave them additional ones, or withdrew those already granted. They certainly could not hold their present powers in abeyance until Parliament took some action upon a report which as yet had not been laid before them.

Mr. HOWS said he would not press his amendment, but would merely say that he did not think any member of the board would be prepared, in the face of Mr. Gurney's report, to hold up his hand in favour of a motion for proceeding at this precise time with so great a work as that now before

them. Every new plan which was presented to them for the intercepting drainage of the metropolis seemed to be worse than the previous one; and as it was really a problem whether either would succeed, they had no right to decide upon spending eight millions of money without further consideration. Mr. Gurney had been appointed to inquire into the state of the Thames; he had done so, and had recommended certain things to be done which could be effected at comparatively little cost, and which, in his opinion, would probably render the drainage of London by means of large tunnel sewers unnecessary. To him (Mr. Hows) that document appeared to be the most important and valuable that had ever appeared; and he believed there would be found more practical information in its eight pages than in the ponderous blue-book which the board had received from the referee engineers of the Government.

Mr. BURSLEM said he had read Mr. Goldsworthy Gurney's recommendations, and also Dr. Barnes's and Mr. Freebody's, and he believed there were good and useful suggestions in them all. But what, he asked, had either of them to do with the question now before the board, which was that certain documents received from the First Commissioner of Works should be referred to the engineers who were already in possession of the previous papers on the same subject?

Mr. DIXON said he had tested the quality of the water of the Thames under the most unfavourable circumstances, and taken from the narrowest part of the river, and he had proved that it was by no means so bad as represented. He believed that the channel of the river was the proper main sewer of the metropolis, and that, if it had not been tampered with by, he would not say medical quacks, but by the Board of Health opening some thousands of cesspools into it, the public would have had little reason to complain of the state of old Father Thames. He had read Mr. Gurney's report with great pleasure, and considered there was a great deal of truth in it, though he too had run into error. At some future time, when the matter came before the board in a tangible shape, they would do well to consider it, but at present their duty was to carry out the Act of Parliament. (Hear, hear.) It was for that purpose they had been called into existence as a board, and it would be very absurd for them to put a rope about their own necks, which they would certainly do by acccepting Mr. Hows' amendment.

Mr. D'IFFANGER said he quite participated in the views held by Mr. Hows. For his own part, he rejoiced in the delay which had already taken place, and should still more rejoice if another year passed without anything being done, as no evil could arise, and the ratepayers would keep their money in their pockets. Possibly, too, by that time they might have another report even more valuable than Mr. Gurney's, though respecting that he would say that, if carried out, he believed it would obviate the necessity for a great scheme of intercepting drainage. Mr. Gurney proposed to get rid of all tide-locked sewers——

The CHAIRMAN: How does he propose to do that?

Mr. CARPMAEL: He does not propose it at all.

Mr. D'IFFANGER said he proposed to do it by pumping. He thought it would be well to refer Mr. Gurney's plan to the engineers for consideration.

The CHAIRMAN said the discussion before the board had no reference to any particular plan; but, having sent certain documents to the engineers, the board were now asked to call upon them to report with all convenient speed. After they had reported, probably Mr. Hows would be in order in proposing a discussion upon Mr. Gurney's recommendations.

Mr. WRIGHT complained of informality in the proceedings of the board. They were discussing a communication from their engineers upon documents which had not as yet been transmitted to them.

Mr. BAZALGETTE asked leave to explain. The engineers with whom he was associated asked the board in the first instance to obtain for them certain information with respect to the plans submitted for their consideration. That information was, as he believed and as the board understood, furnished by the Government referees last Friday. He (Mr. Bazalgette) immediately made copies of the documents received, and placed them in the hands of Messrs. Hawksley and Bidder. As soon, however, as they came to look into them they found that they were not what they had asked for, but, in fact, the details of a new scheme altogether, and they therefore felt bound to report the fact to the board. (Hear, hear.) Had they not done so, the board would not know what was before them, and what they had placed in their hands.

Mr. WRIGHT maintained that the whole proceeding was irregular, and that the engineers associated with Mr. Bazalgette had reported upon a matter not formally referred to them. He asked whether any resolution had been adopted by the board in reference to the papers last sent from the Government?

The CHAIRMAN said the engineers asked for information, and, when the documents were received from the First Commissioner, the board concluded that they contained what was wanted. Mr. Bazalgette accordingly had copies made for their use, which, upon examination, proved to be otherwise—in fact, the details of a new plan. The engineers, therefore, very properly reported that fact to the board.

Mr. SAVAGE said, although the board had adopted no formal resolution on the subject, it was clearly understood that the information obtained would be made use of by the engineer.

Mr. WRIGHT said it was adopting a bad precedent to discuss a report from the engineers upon a subject not referred to them. The minutes of the board should contain a record of all their transactions, which could not be the case if such irregularities were permitted. Under the circumstances of the case he would move, as an amendment, that the words in the motion from "regretting" down to "scheme," inclusive, be left out.

Major LYON seconded the amendment, believing that every object desired by the board would be effected thereby. In reference to Mr. Hows' suggestion he would remark, that Mr. Goldsworthy Gurney's report was in reply to a definite inquiry proposed to him—not a report upon the drainage of the metropolis; and it was therefore foreign to the purpose for which the board were met, valuable as it was in its way.

Mr. BRISTOW replied to Mr. Wright's complaint of irregularity, by reminding him that some time back the board referred all the documents received to Messrs. Bidder, Hawksley, and Bazalgette, with instructions to them to report. The documents laid before the board at their previous meeting were very naturally supposed to be what they had asked the First Commissioner to furnish, viz., the details of the plan proposed by his referees. Under such circumstances, there was no necessity formally to refer them, but they would be taken by the engineer as a matter of course. His friend, Mr. Wright, therefore had discovered a mare's nest, for there had been no irregularity at all, except in the innermost region of red-tapeism. Whatever papers were received upon the subject of the plans already referred to, would, as a matter of sequence, go to the engineers. He suggested, however, for the sake of unanimity, that the amendment should take the following form, viz.: "That the board transmits the papers last received from the First Commissioner to the referees, and requests those gentlemen to report to the board on their present materials with all practicable speed." What they now wanted was that, instead of waiting for further details, they should proceed with the question as it now stood. (Hear, hear.)

Mr. Hows refused to accept the amendment, having determined not to vote for any system of tunnel sewerage, convinced as he was from reading Mr. Gurney's report, that the Thames could be made to do all the work of London.

Mr. SNOW considered that the embankment of the Thames was the great desideratum, and hoped the board would not commit themselves to a large expenditure for intercepting drainage until they had well deliberated upon the matter. Believing that such would be the case if they adopted the amendment he should vote against it.

Mr. TURNER approved of the amendment, because he thought that whatever regret the board might feel at the delay which had arisen, the present was not the proper place to express it. If they were now in direct communication with Sir B. Hall, it would be very well, but it was altogether unnecessary in a communication with their own engineers.

Deputy HARRISON felt that there was the greatest possible objection to the first part of the motion, as it expressed an opinion upon a plan which they had not considered. After the delays which had arisen, it was not to be wondered at that the members of the board should be anxious to come to a decision, and should determine that they would pause no longer in their work. They very naturally looked to what was their duty, and what the public required of them; and therefore they did well to ask their engineers to report at the earliest possible moment. They had asked again and again for information, and they had been disappointed; and now they were about practically to determine that they would apply no more, but would adopt such a plan as would commend itself to the approval of the public, if not to that of the gentleman who had a veto. That was the substance of the amendment, and for that he was prepared to vote. There was no need to express regret; it would be for the public to determine hereafter whether the board had been properly treated, or whether they had not had impediments thrown in their way of the most extraordinary character.

Mr H. L. TAYLOR thought that between the motion and the amendment there was a distinction without a difference. They all felt regret that so much valuable time had been lost through the over-officiousness of the First Commissioner, who had overstepped the bounds which the statute prescribed. In the letter of Mr. Austin addressed to the board in November, 1856, it was stated—"The First Commissioner desires me distinctly to state that he has no desire and no intention to interfere in any way in this matter, beyond the discharge of the duty imposed upon him by the statute." Now, in the face of that statement, it was quite clear that Sir B. Hall had not acted consistently in interposing an authority beyond that which the statute gave him, and from the fact of his having exceeded his powers all the delay of which they complained had arisen. What had been the benefit of that delay? Had it been to produce from the three distinguished engineers to whom the matter was referred a plan which was acceptable to this board or the public? Why, from Land's End to John-o'-Groat's, that scheme had been universally condemned as absurd and impracticable, and every attempt they had made to mend it had made it only so much the worse. He, for one, therefore, felt no difficulty in accepting the motion of Mr. Carpmael, for he did feel most sincere regret at the delay. Mr. D'Iffanger might be satisfied on the point, because it had allowed time for the production of Mr. Gurney's report; but let it be remembered that that gentleman did not pretend to deal with the question of the drainage of the metropolis. It was all very well to say "wait a little longer," and perhaps something even better might be forthcoming; the public were of opinion that the board had waited long enough, and they were not sparing in their blame that so little had been accomplished. A representative board, called into existence as they were through the instrumentality of Sir B. Hall, was very naturally expected to do something and to do it promptly. The Metropolitan Board, in the first year of its existence, did their best to carry out the purpose of their appointment, but since then they had been between wind and water, between earth and Heaven, unable to take another step, and that, too, by the intervention of the First Commissioner. Doubtless this was much to be regretted, and, therefore, he would vote for the motion.

Mr. CRELLIN could not say that he felt regret—he felt angry at the delay. All his regret was that the board themselves had been so neglectful in not pressing the First Commissioner for a decision twelve months ago, and intimating to him that he had no power to call for other plans than those sent in by them. That was the beginning of their error, and the only step they could take to retrace it was to require the gentlemen to whom they had referred their plans to report as quickly as possible, without recognizing the plan of the Government engineers.

Mr. HAWKES regretted that from the first this board had refused to look at any other plan than the one they found in the office. The feeling was gaining strength in the public mind that the state of the Thames demanded early attention; and if this board refused to take action upon Mr. Gurney's report they might have it forced upon them.

Colonel KENNEDY rejoiced at the delay, and that the board were able to throw the responsibility of it upon the First Commissioner, so that in the minds of the public it would not rest at their doors. He was strongly of opinion that they ought not to enter upon the execution of extensive works before they had clearly ascertained where the money was to come from. Their present Act of Parliament gave them no means of carrying out the vast operations it enjoined them to perform except by diving their hands deeply into the ratepayers' pockets. It had withdrawn all those numerous means which did exist prior to the establishment of the board for executing public works. The delay which had arisen would enable them to go to Parliament and ask for the revival of those resources, and he was persuaded they would obtain them when they were prepared with a proper plan. At this delay, therefore, he was rejoiced, though he did blame the First Commissioner for appointing a second tribunal—a tribunal of critics—to prepare plans. The first requisite in an engineer was that he should be a good critic, and he (Colonel Kennedy) would defy two boards of engineers to agree upon any subject in the world. (A laugh.)

Mr. CARPMAEL replied at some length, and vindicated the expressions of regret contained in his motion. The board had not been treated fairly by the First Commissioner nor by his engineers, from whom they had sought information. They had asked for bread, and Sir Benjamin had given them a stone; for further particulars, and he had sent them a new plan. In reference to Mr. Goldsworthy Gurney's report, which had been so frequently referred to, he would merely say that all which that gentleman proposed was a means of preventing the noxious effluvia coming from the main sewers in the vicinity of the Houses of Parliament, and he dealt with that only.

The board then divided, when the amendment was carried by a majority of 20 to 5.

It was then moved by Mr. CARPMAEL, and seconded by Mr. DALTON, that the papers last received, with the plans and sections, be printed and circulated among the members.

On a show of hands, the motion was negatived.

It was then ordered that the chairman be authorized to print the report of Messrs. Hawksley, Bidder, and Bazalgette as soon as received.

Mr. BRISTOW inquired when it was likely that report would be ready?

Mr. BAZALGETTE said a great deal of the engineers' work, up to the present time, had been thrown away upon an investigation of the referees' plans, which were now abandoned. They had received further plans, which would require considerable attention. No time, however, would be lost in making their report, and he hoped that in about a month they would be prepared with it. Had all the facts of the case been in their possession in the first instance, he had no doubt the report would have been ready at this time.

The board then adjourned.

THE METROPOLITAN GAS QUESTION.

The Adjourned Meeting of the General Committee of the Delegates from the various Metropolitan Parishes, appointed to decide on the form of a Petition to Parliament for the purpose of obtaining a Committee of the House of Commons as to the present System of Gas Lighting, resulting from the recent Districting of the respective Companies, was held on Wednesday, January 6, at the Court House, Marylebone.

The vestries and district boards represented were—

MARYLEBONE—Dr. Bachhoffner, Mr. Freeth, Mr. Hodges, and Mr. Hattersley.
ST. PANCRAS—Mr. H. Farrer and Mr. D. E. Cameron.
PADDINGTON—Mr. Dickenson.
STRAND DISTRICT—Mr. Walker and Mr. Lewis.
ST. JAMES'S, WESTMINSTER—Mr. Beale and Mr. Geesin.
ST. GILES'S—Mr. Peacock.
ST. MARTIN'S-IN-THE-FIELDS—Mr. Petter.
ST. MARY'S, ISLINGTON—Mr. Elt and Mr. James.
ST. LUKE'S—Mr. Holland.
WESTMINSTER DISTRICT BOARD—Mr. Clarke.
CLERKENWELL—Mr. Paget.
ST. MARY'S, LAMBETH.—Mr. Stratton and another delegate.
ST. MARY'S, NEWINGTON—Mr. Redfern.
ST. GILES'S, CAMBERWELL—Mr. Kintrea and another.
ST. GEORGE-THE-MARTYR, SOUTHWARK—Dr. Challice and Mr. Beaumont, &c., &c.

Dr. BACHHOFFNER was called to the chair. He observed that the object of their meeting that day was to receive and decide upon the adoption of a petition to Parliament which a sub-committee had been appointed to prepare. That committee had power delegated to them by the general meeting to draw up and adopt such petition, and then to direct it to be forwarded to the respective vestries of the metropolitan parishes and district boards. It would be perhaps proper that the petition should in the first place be read and moved *pro formâ*, and then that they should discuss the clauses *seriatim*. (Hear.)

Mr. FREETH said, as the chairman of the sub-committee appointed by them to draw up this petition, the duty naturally devolved upon him to move the reception of the petition they had drawn up, which he had much pleasure in doing. Before doing so, however, he wished to express his regret that there should have been a misunderstanding as to the time of their last meeting. Had he been aware that their respected chairman, Dr. Bachhoffner, would not have been present, he would most assuredly have been in his place earlier than he had been on the previous occasion. There was, however, some mistake made as to the time of holding that meeting. With reference to the petition, however, which he and his colleagues of the sub-committee—six or seven in number—had drawn up, it became his duty to ask them to receive it, as their ideas of what a petition on such a subject really ought to be. Although it might not go sufficiently into detail for some gentlemen, he could assure that meeting that the polar star which had guided the sub-committee in framing it was, that it should be a petition which should be the least open to objection. He begged to assure them that where a gentleman found his views in reference to the framing of the petition were not consonant with the opinions of a majority of the committee, such member at once made a sacrifice of his feelings, and bowed to the general decision. He (Mr. Freeth) hoped that the delegates then assembled would receive the petition, and consider it in the same liberal spirit, and not allow that which was intended to exhibit a general opinion to be marred by any crotchets or schemes intended to meet the views of isolated cases or localities. (Hear, hear.)

Mr. STRATTON, of Lambeth, said he would second the reception of the petition, which was carried.

The CHAIRMAN would now read the first clause, which was, as proposed to be, as follows:—"That your petitioners have been informed, and believe, that the various gas companies have recently divided the metropolis into districts, to be supplied by particular companies, the other companies withdrawing from such districts, and thus creating in effect a monopoly by destroying competition."

Mr. CLARKE (Westminster) moved, and Mr. FREETH (Marylebone) seconded, "That the paragraph read form part of the petition."

Mr. BEALE (St. James's): Would it not be better to state our actual knowledge of the system of districting?

Mr. KINTREA (Camberwell): That will be inferred from the statement made. (Hear, hear.)

Mr. FREETH: In the common parlance of a petition, if you state therein that the petitioners are informed and believe, it is always assumed that it is a fact which had obtained public notoriety, and therefore the words "informed and believe" were quite sufficiently indicative of the districting by the gas companies being a fact. (Hear, hear.)

The first paragraph was then put and adopted.

Mr. KINTREA then moved, and Mr. STRATTON, of Lambeth, seconded, the next clause of the petition, viz.:—"That one of the principal evils of this monopoly of districting is, that the consumers are placed entirely at the mercy of the metropolitan gas companies in respect of price, quality, and quantity."

Carried unanimously, without discussion.

The CHAIRMAN read the third paragraph—"That your petitioners are informed, and believe, that most of the gas companies that now supply London with gas obtained their Act of Parliament on the distinct basis of competition."

Mr. CLARKE moved the adoption of this clause of the petition.

Mr. STRATTON seconded it with great pleasure. So far as Lambeth was concerned, he perfectly well remembered that, when the London Company desired to come in there, they sent round persons whose business it was to show the gas consumers that they would derive great advantages from competition, in the shape of a large reduction in the price as well as superiority in quality. Indeed, they were told they would have lights for somewhere about £2, for which at that time they were paying £5. (Hear, hear.) He must say, however, that when the company got in they were grievously disappointed. (Hear, hear.)

Mr. BEALE said there was one thing quite certain, and that was, that the House of Commons never intended that these gas companies should have their Acts of Parliament for the purposes of monopoly. Such a proceeding was entirely contrary to and subversive of the legislative principle which had been adopted by Parliament for years. (Hear, hear.) There could not, therefore, he thought, be the slightest objection to such a clause being in the petition.

Mr. FREETH said, as a further proof that Mr. Beale was quite right as to these districting arrangements being contrary to the principles of Parliament, as having a tendency to monopoly, it must be borne in mind that the preamble of every one of these Acts of Parliament professed that they were applied for the public good and to meet the public necessities and requirements. (Hear, hear.) If, therefore, the gas companies committed acts which established a monopoly, how could that be for the public good? (Hear, hear.) If by this districting the companies were enabled to effect a saving of 40 or 50 per cent., and they allowed the consumers to participate in the advantage in proportion, then the proceeding might be within the meaning of their Acts of Parliament; but otherwise it was a perfect violation of the principle upon which Parliament consented to grant them those Acts. (Hear.)

The third clause was then carried, *nem. con.*

Mr. KINTREA said he now wished to follow up that clause by another, which although not sent up and adopted by the sub-committee, he thought would come in there most appropriately, as it would be a confirmation of the paragraph just adopted. It would be remembered by those who were acquainted with the gas question on the south side of London, that the Phœnix endeavoured to drive the other companies into a districting arrangement, and worked the Surrey Gas Consumers' Company so, that they, and ultimately the four South London gas companies, agreed to go to Parliament for powers to carry out the principle of districting; but the gas consumers and others, becoming alive to the question, an agitation was commenced which induced Parliament to refuse to sanction districting arrangements on the south side of London. He thought it most advisable that this point should be forcibly put in the petition, as an illustration of the fact that Parliament had already set their faces against a principle which the companies had now ventured to carry out in defiance of parliamentary sanction. He therefore begged to move the following clause to follow the third clause just adopted:—"That your petitioners beg to remind your honourable House that an attempt was made a few years ago to obtain legal sanction to a districting arrangement entered into amongst several gas companies in South London, but it failed to obtain the sanction of your honourable House."

Mr. PETTER (St. Martin's) thought this was a very important fact which ought not to be omitted, and he would therefore second the adoption of this clause in the petition.

Mr FARRER could hardly understand how it could be said that districting was contrary to the principles of parliamentary legislation, when Sir B. Hall's Local Management Act even divided parishes into districts. ("Oh, oh!" and "Question.")

Mr. BEALE would advise Mr. Kintrea not to press this resolution, as it stated that which might be disputed as a matter of fact. He had heard a very different version of why the districting by the South London gas companies was not formerly carried out, and he believed he was correct in saying that they never went before the House of Commons at all. It must be borne in mind that every statement made in the petition for a committee of the House of Commons would be tested to the greatest extent, and therefore the greatest care must be taken not to place a word in it that could not be established in every possible way. The version he had heard of the South London districting question was, that a certain non-elected public body in Southwark had said to the companies, "If you choose to carry through Parliament a bill legalizing the districting, upon the condition that you give us control over the quality, price, and meterage." A bill was introduced by Mr. Locke King and Sir James Duke, but public attention having been called to it, the agitation was so great that Mr. Locke King withdrew the bill; but he (Mr. Beale) did not think Mr. Kintrea, or any one else, would find any resolution of the House of Commons upon the subject. Under these circumstances he trusted that Mr. Kintrea would not press his motion.

Mr. CAMERON considered with Mr. Beale that it would be most impolitic to go before the House of Commons with any statement upon which there was the slightest doubt. Moreover, to enter into any details would be a prejudging of the question, which would more legitimately come under a committee of the House of Commons, should one be appointed.

Dr. CHALLICE said Sir B. Hall was the first who saw with eagle eye the effect of the proposal and bill for districting applied for by the Surrey companies, and he at once put his veto upon it, and said it would in effect be a monopoly. Sir William Molesworth, who was waited upon with Sir B. Hall, also concurred in that view; and, when the promoters knew the feeling in such quarters, the bill was withdrawn. That which the South London companies had sought an Act of Parliament to do formerly, they had now effected by a private arrangement; and many lawyers of considerable eminence who had been consulted were clearly of opinion that such districting was illegal, and that the companies might have an injunction obtained against them. He thought, therefore, a reference to this matter was a very proper point for the petition; but he feared that, large as South London was, unless the suggestion came from Marylebone, an extinguisher was put upon a person proposing anything, at once. (Loud dissent.) He admitted that it was perfectly right that Marylebone, in this as well as other metropolitan questions, should be permitted to take the lead; but, at the same time, the opinions of those who represented other districts ought not to be entirely set aside. (Hear, hear.) He (Dr. Challice) believed that the statement which had been made by Mr. Kintrea could be fully borne out by evidence, but that perhaps it had better not be introduced into the petition. (Hear, hear.) He knew his friend Mr. Kintrea was a man of strong impulse, and might propose a motion without reflection as to its effect. ("Oh!" and a laugh.)

Mr. KINTREA thought he might exclaim, "Heaven save me from my friends!" (Laughter, and "Hear, hear.") He had endeavoured to introduce the same resolution in the sub-committee, but they seemed to like their own ideas a great deal better; but he was surprised to hear that this matter did not concern this side of the water. (Oh, oh!) He thought that it was

very wrong that, because the subject had originated with Marylebone, that it should not be extended to the other side of the metropolis. He would, however, with the permission of the meeting, withdraw this proposition, and move another, which he thought would meet the objections which had been raised.

Mr. PETTER having assented, the motion was withdrawn.

Mr. KINTREA then moved the adoption of the following:—"Your petitioners beg to remind your honourable House that an attempt was made some few years ago to procure legal sanction to a districting arrangement entered into by several gas companies in South London, but did not succeed in consequence of great public opposition."

Mr. REDFERN seconded the motion, that this clause be embodied in the petition.

Mr. BEALE said, in expressing his opinion upon this resolution, he felt bound to state that during the whole of their deliberations, either upon this or any public question, when the parochial authorities of the metropolis had been called together, had he seen any act on the part of the gentlemen of Marylebone which called for such an observation as that indulged in by Dr. Challice. (Hear, hear.) He had again to appeal to his friend, Mr. Kintrea, not to press a matter to be inserted in the petition upon a subject of somewhat doubtful history. He thought that one point was quite certain, namely, that the House of Commons had never affirmed any opinion upon the question of the districting of gas companies at all. He felt sure that he was right, that as an equivalent for being permitted to district themselves, the companies were to give a guarantee in their bill for meterage, price, and quality—that is, that all these points should be tested by some public officer appointed for the purpose. Mr. Warrington, of Apothecaries' Hall, he (Mr. Beale) believed was appointed to test the quality, and there was some person in the Borough Road also appointed to test the gas-meters. He thought it would be wrong to mix this matter up in the general petition, but at the same time he would suggest a course which he thought would meet Mr. Kintrea's and Dr. Challice's views, namely, that he should withdraw his motion with respect to the general petition, and introduce it as a local matter of complaint, in all the petitions if they thought proper, from the South London districts. (Hear, hear.)

Mr. FREETH begged to remark that their petition was a mere skeleton petition for general purposes, but if there was any local case, that could also be added by the district to which any grievance applied. (Hear, hear.)

Mr. WALKER (Strand) said he should support this proposal. Although he had voted for the sub-committee to draw up this petition, he had understood that that petition, when drawn, was to come before that body to be debated before they subscribed to it, and not that they were to be ridden rough shod over, and compelled to vote for the petition as drawn up.

The CHAIRMAN begged to assure Mr. Walker that he was arguing entirely on a wrong basis. The committee were not at all bound to adopt the petition, or any particular paragraph, drawn by the sub-committee.

Mr. WALKER understood that Mr. Beale objected to any addition.

Mr. BEALE said what he suggested was that the petition should be adopted and sent as a whole to the various vestries and district boards, and that then they could either add such paragraphs as they might consider adapted to local circumstances, or leave out any they did not consider applicable to their particular case.

Mr. GREENWELL (vestry-clerk of Marylebone) said of course the vestry of St. Marylebone would have to adopt the petition as their own before they sent it to other boards.

Mr. REDFERN did not see that that was necessary, although it was understood that it was to go to the vestry of Marylebone before going to the other boards.

Mr. FREETH regretted the observation which had fallen from Dr. Challice in reference to Marylebone, which had been properly vindicated by Mr. Beale. They had never had any other object in view but the general good in this matter, and therefore they had excluded from the petition their own particular grievance, although they had a strong one with these gas companies.

Mr. REDFERN thought Dr. Challice made the remark to show that the people on the Surrey side of the water had some sagacity as well as those on the Middlesex side. (Hear, hear.)

Mr. FREETH begged it to be understood that this was not a mere local movement, or Marylebone question; and, unless they were united like a bundle of sticks, and made of this a combined movement, they would become an easy prey to these gas companies. (Hear, hear.) There were the cases of Marylebone, the strong case of Wandsworth, where they were charged £6 per light, as well as Southwark—they were all strong grievances, but he thought they would act wisely in reserving their grievances for a committee. (Hear, hear.) Let them send in their petition in general terms, and let them say to the House of Commons, "Give us a committee, and we will show you our grievances." It would, of course, suit the companies and the gas lighting journals that they should have differences amongst themselves, but he begged of them to let them have no petty jealousies. (Hear, hear.) Marylebone paid one-twelfth of the entire taxation of the metropolis, and he asked their friends from the other side of the water not to be jealous that the parish who paid the largest share took the lead. (Hear, hear.) He could assure the gentlemen that they paid every deference to the opinions of the deputations from other parishes, and he could not understand the ground for the observation which had been made.

Mr. STRATTON said, on the part of Lambeth, he could assure them that they had no jealousy of Marylebone. They felt deeply indebted to Marylebone for having taken this important matter up, and summoned all the parishes. (Hear, hear.)

Dr. CHALLICE said, as far as South London was concerned, there was no jealousy. (Hear, hear.) There was, however, he thought, some deference due to the opinions of the other districts, more especially as their object was to call upon the metropolitan members to support their petition. It was true, as he had before observed, that Sir B. Hall was the first with eagle eye to detect that the effect of this districting of the gas companies was a tendency to securing for themselves a monopoly, and therefore, so far, there was no doubt but they had his good wishes in their movement; but at the same time it should be remembered that, from his connexion with the Government, the hands of the right honourable member for Marylebone were tied. There could be no doubt of the fact that there was virtually, throughout the entire metropolis, a most grievous monopoly of one of the most important necessaries of life; and he (Dr. Challice) was prepared to stake his reputation as to the fact of the attempt having been made to legalize the districting on the part of the South London companies, as stated in the proposal of Mr. Kintrea. He, therefore, thought it was not right that they should ignore such an important fact from their petition, and give it the go-bye. (No. no.) It was, at all events, a very dangerous point for the gas companies, and one which he thought Parliament would attend to. It would be helping, he thought, their cause materially; and when they came to details, he considered that they should have no difficulty in showing that, but for the agitation kept up, they would be compelled to pay the South London gas companies 6s. or 7s. per 1000 feet.

Mr. BEALE must correct Dr. Challice. They had no desire to ignore the fact, nor the fact of a grievance specially applying to any particular district. He thought, however, that the introduction of the point specially into the local petition would meet all that was required. (Hear, hear.)

Mr. CAMERON must certainly object to the introduction of this clause into the general petition, as they had not distinct evidence as to the matter of fact.

Mr. ELT said since they had last met a most harsh and arbitrary case of grievance, arising from the course adopted by one of the gas companies, had come to his knowledge; but his idea was, that they should not let the companies know their case before they came before the parliamentary committee.

Mr. PEACOCK, of St. Giles's, considered that they should keep their petition as general as they could. (Hear, hear.)

The CHAIRMAN hoped the committee would allow him to suggest that they should first agree to the terms of the general petition, and then that it should be left to the discretion of the several vestries or district boards to whom it was sent to strike out any clause they might think proper, or object to and insert any which they thought valuable as showing any special grievance suffered by the particular district. If this were agreed to, he thought it would meet the views of Mr. Kintrea, Dr. Challice, and the gentlemen from the other side of the water. (Hear, hear.)

Mr. REDFERN said, if this was to be understood, he would, as the seconder, at once consent to the withdrawal of the clause. (Hear, hear.)

Mr. KINTREA was aware of the desirability that there should be no difference of opinion upon this important subject; and, therefore, he not only, after the suggestions which had been thrown out, begged to withdraw his resolution, but, at the same time, on the part of Camberwell, to disclaim any feeling of jealousy whatever at Marylebone taking the lead. (Hear, hear.) On the contrary, they were deeply indebted to Marylebone for having taken the initiative. ("Hear, hear," and cheers.)

Mr. REDFERN begged to put in a similar disclaimer of jealousy on the part of the vestry of Newington; and he thought he might do the same for all the vestries on the south side of the water. (Hear, hear.)

Mr. KINTREA's motion was then withdrawn.

The CHAIRMAN said he would now read the fourth clause, upon which he did not anticipate any discussion, as it was generally agreed to at the previous meeting. It was—"That the importance of this matter to the parochial authorities and gas consumers of the metropolis may be estimated by the statement which appears at page 60, Appendix I., No. 38, in the report of Messrs. Galton, Simpson, and Blackwell, on metropolitan drainage, dated the 3rd of August, 1857, and ordered by your honourable House to be printed, as follows:—'According to an estimate of George Lowe, Esq., C.E., engineer to the Chartered Gas Company, London, the annual consumption of coal for the purpose of gas-making in London is about 840,000 tons, which would yield 7,728,000,000 cubic feet of gas: the value of this volume of gas would be, at 4s. 6d. per 1000 cubic feet, £1,738,000.' And your petitioners are informed, and believe, that the annual sum paid by the various gas companies in London for gas is near £2,000,000 per annum, and which will be constantly increasing."

This was at once put and carried.

The CHAIRMAN said the 5th clause was a most important one, as it related to a maximum charge and a standard quality of the gas to be supplied. The very fact of their getting the gas companies before Parliament—and which, no doubt, they were themselves desirous of not doing—was, that if they did get the companies there, much benefit would certainly accrue, as it was compulsory that the Gas Lighting Clauses Act shall be incorporated with the Act of any company coming before Parliament. Therefore, if they only succeeded in getting the companies before Parliament, they must be subject to the restricting powers contained in the Gas Lighting Clauses Act. (Hear, hear.) The proposed clause was, "That your petitioners submit that the several gas companies should be restricted by legislative enactment to a maximum charge for, and be bound by a particular standard in, the quality of the gas supplied by them."

Agreed to.

The CHAIRMAN said he would now read the prayer of the petition, which was—"Your petitioners therefore pray that your honourable House will cause an inquiry to be made into the existing arrangements for the supply of gas, and that you will be pleased to adopt such measures as to your honourable House shall seem meet for protecting the interests of the gas consumers of the metropolis."

Mr. WALKER understood that the grand object of the petition was to ask for a committee of the House of Commons. (Hear, hear.) He thought, therefore, that after the words "will cause an inquiry," the words "by a committee" should be inserted in the prayer of the petition. (Hear.) He begged to move an amendment to that effect. (Hear.)

Mr. KINTREA seconded this amendment. Unless they introduced the words asking for a committee the petition would be vague.

Mr. PEACOCK said he understood that the reason the words asking for a committee were left out was, that it was feared if the House of Commons were asked for a committee, that they, the delegates of the metropolitan parishes, would be put to the expenses of the appointment of such committee; whereas, if they left the appointment of the committee voluntarily to the House of Commons, no such expense on their part would be incurred.

Mr. WALKER said he had no desire to press for these words being inserted if it was felt that it would involve the parishes in a large cost for the expenses of this committee of the House of Commons.

Mr. BEALE strenuously urged that the words asking for the committee should be inserted in the petition. Not only should they ask for a committee, but show that they had made up their minds to have it. As to the expenses falling upon the parishes because they asked for the committee, it was all moonshine. It was a distinct understanding amongst the general body of the delegates that they were to apply to Parliament for a committee of investigation. (Hear, hear.) They knew very well that the companies dreaded this more than anything else, and no doubt they would be well supplied by counsel. Under any circumstances, the parishes must also have counsel. He would ask, was the fear of a little expense to deter them from obtaining from a parliamentary committee the basis of an Act which would, perhaps, end the dispute, and secure justice to the metropolis? (Hear, hear.)

Mr. FARRER said it struck him that the delegates were not empowered to go so far as Mr. Beale had done as to the question of expense. He could only say, so far as St. Pancras were concerned, they were not at present so empowered.

Mr. KINTREA was not disposed to yield so important a point in the prayer of the petition on the ground of a mere question of expense. (Hear, hear.)

The amendment was put and carried unanimously.

The petition was then agreed to in the following form:—

To the Honourable the Commons of the United Kingdom of Great Britain and Ireland, in Parliament assembled.

The humble petition of [a blank is left here for the names of several parishes and districts]

Sheweth—

That your petitioners have been informed, and believe, that the various gas companies have recently divided the metropolis into districts, to be supplied by particular companies, the other companies withdrawing from such districts, and thus creating in effect a monopoly by destroying competition.

That one of the principal evils of this monopoly of districting is, that the consumers are placed entirely at the mercy of the metropolitan gas companies in respect of price, quality, and quantity.

That your petitioners are informed, and believe, that most of the gas companies which now supply London with gas obtained their Act of Parliament on the distinct basis of competition.

That the article of gas has become not only a luxury but an actual necessity to the inhabitants of this metropolis. That the importance of this matter to the parochial authorities and gas consumers of the metropolis may be estimated by the statement which appears at page 60, Appendix I., No. 38, in the report of Messrs. Galton, Simpson, and Blackwell, on metropolitan drainage, dated Aug. 3, 1857, and ordered by your honourable House to be printed, as follows:—"According to an estimate of George Lowe, Esq., C.E., engineer to the Chartered Gas Company, London, the annual consumption of coal for the purpose of gas-making in London is about 840,000 tons, which would yield 7,728,000,000 cubic feet of gas: the value of this volume of gas would be, at 4s. 6d. per 1000 cubic feet, £1,738,800." And your petitioners are informed, and believe, that the annual sum paid to the various gas companies in London for gas is nearly £2,000,000 per annum, and which will be constantly increasing.

Your petitioners submit that the several gas companies should be restricted by legislative enactments to a maximum charge for, and be bound by a particular standard in, the quality of the gas supplied by them.

Your petitioners therefore humbly pray that you will cause an inquiry to be made by a committee of your honourable House into the existing arrangements for the supply of gas, and that you will be pleased to adopt such measures as to your honourable House shall seem meet for protecting the interests of the gas consumers of the metropolis. And your petitioners will ever pray, &c.

Mr. FREETH said he would now move "That the vestry of Marylebone be requested to print and forward copies of this petition to the vestry of every metropolitan parish and district board, with power to each to make such alterations or additions therein as they might think proper." (Hear, hear.)

Mr. KINTREA seconded this resolution.

The motion was put and carried unanimously.

Mr. KINTREA would now propose a vote of thanks to the chairman for his courtesy and impartiality, and for the patience with which he had listened to every suggestion made throughout their long discussion.

The motion was seconded and carried unanimously, and the proceedings of the committee terminated.

WEDNESDAY, JAN. 13.

The Adjourned General Meeting of the Deputations from the various Vestries and District Boards of the Metropolis, in reference to the recent districting of the gas companies, took place on Wednesday, the 13th inst., at the Marylebone Court House.

Dr. BACHHOFFNER was, at two o'clock, called to the chair.

The deputations present were as follows:—

ST. MARYLEBONE—Dr. Bachhoffner, Mr. Hodges, Mr. Braess, Captain Smy, Mr. Wingfield, Mr. Freeth, Mr. Babbage, Mr. Tavener, Mr. Hattersley, Mr. Hendry, Mr. Williams, and Mr. Gliddon.

ST. JAMES'S, WESTMINSTER—Mr. Stevens, Mr. Geesin, and Mr. Beale.

ST. MARY'S, ISLINGTON—Mr. Elt, Mr. Grant, Mr. Collingridge, and Mr. Berry (clerk).

STRAND DISTRICT BOARD—Mr. Walker and Mr Fry.

ST. GILES'S—Mr. Peacock, Mr. Waring, and Mr. Steadhall.

PADDINGTON—Mr. Pearce and Mr. Jackson.

ST. MARTIN'S-IN-THE-FIELDS—Mr. Johnson, Mr. Petter, Mr. Soames, and Mr. Tempany.

FULHAM—Mr. Johnson.

WANDSWORTH—Mr. Jackson and Mr. Nicholson.

WESTMINSTER—Mr. G. Hughes.

ST. MARY'S, NEWINGTON—Mr. Redfern, Mr. Jones, and Mr. Holland.

HOLBORN—Mr. Hopwood and Mr. Winter.

CAMBERWELL—Mr. Kintrea and Mr. Reynolds.

LAMBETH—Mr. Stratton, Mr. Wood, Mr. Jeffree, and Mr. Warren.

HAMMERSMITH—Mr. Fitchew.

CLERKENWELL—Mr. Eustace, Mr. Greenwood, Mr. Lawrence, and Mr. Paget (clerk).

LEWISHAM—Mr. Edwards.

LIMEHOUSE—Mr. Sutton.

MILE END OLD TOWN—Mr. Hollingsworth and Mr. Leatherdale.

The CHAIRMAN said, since the general body of the delegates from the metropolitan parishes had last assembled, the committee they had appointed to draw up a petition to the House of Commons had held meetings, and, having appointed a sub-committee to draw such petition, they had met on the previous week and adopted it. He did not apprehend that it was the object of the general body meeting there that day to ratify that petition, because they had delegated powers to the committee not only to draw such petition but to forward it at once to the various vestries and district boards, with a request that they will adopt the same as a general petition, and have their respective corporate seals attached thereto. The petition adopted by the committee had been already printed, and would that day be circulated to the proper officers of the respective vestries and district boards. It would be for the deputations then present to decide as to what other steps they deemed it necessary to take with respect to the subject upon which they had assembled.

Mr. GREENWELL, the vestry clerk of Marylebone, who acted as honorary secretary, read the petition as adopted by the committee, and the minutes of the preceding meeting.

Mr FREETH said there was a resolution passed after the adoption of the committee which enabled the various vestries and district boards to make such alterations and amendments in the petitions as they thought proper to suit the case of their particular locality. (Hear, hear.)

The CHAIRMAN remembered a discussion upon the point, and a general understanding that such should be the case, but he did not recollect a formal resolution being moved on the subject.

Mr. FREETH begged the chairman's pardon. He had himself moved the resolution; and it arose out of the question as to putting in the special grievance as to Southwark.

Mr. JACKSON (Wandsworth) said he had certainly seen that such a resolution was passed in some of the papers.

Mr. KINTREA, and other gentlemen, corroborated Mr. Freeth's statement.

The CHAIRMAN considered nothing could be more proper than that the various vestries and district boards should have the power of cutting out or adding to the petition any paragraph they thought proper. At the same time, as a general petition, it was to be hoped that the vestries would adopt it as a basis, and that they would take the step as early as possible. He knew the difficulty there was in getting these matters before public boards in consequence of the multiplicity of other business. Only on Saturday last, the Marylebone vestry were engaged in a discussion which incidentally arose, and which lasted pretty well from 12 till 3. But for the perseverance of Mr. Freeth they would not have succeeded in getting the petition before the vestry of Marylebone that day, and a resolution passed directing it to be forwarded to the various districts.

Mr. BEALE said he thought that there were two further steps which it was the duty of the deputations from the parishes to take with reference to this gas districting. In the first place, he thought it was advisable to collect all the information they possibly could, with the view of embodying the same in a memorial for presentation to the Secretary of State, and to obtain an appointment with the Secretary of State to present such memorial, and state the case of the metropolis with regard to the gas companies. He considered that it would be advisable to refer the drawing up of this memorial to the same committee as that which had drawn up the petition to Parliament, and that they should ask the vestry of St. Marylebone to put themselves in communication with the Home Secretary and with the metropolitan members to ascertain when it will be convenient for the Home Secretary to receive and the members to attend such deputation.

The CHAIRMAN said he would object to Marylebone being put so prominently forward in the matter.

Mr. BEALE explained that his object was that Marylebone should simply make the arrangements for the deputation waiting upon the Home Secretary. He would, therefore, in the first place, move the following resolution:—"That it be referred to the committee to prepare a memorial for presentation to the Home Secretary."

Mr. FREETH seconded the motion. He found that the proposal to go to the Secretary of State was the next step in accordance with the resolutions of the meeting of the delegates held there on the 2nd of December, 1857—to consist of the delegates then present, and such others as may be nominated. He therefore agreed that the proposal made by Mr. Beale was the proper one.

Mr. PEACOCK (St. Giles's) agreed as to the appointment of a committee; but he thought, as in the case of the petition to Parliament, the better course would be that the sub-committee should draw the memorial, and that instead of appointing the same committee they should now form the committee from the different boards represented. If they went to Parliament they must be fortified at every point, and must not leave out any suggestions, let them come from what quarter they might. It would be better therefore that they should appoint a standing committee, which should conduct all proceedings before the House of Commons committee, should they be successful in obtaining one.

The CHAIRMAN thought the appointment of such committee as that proposed by the honourable delegate from St. Giles's would be a matter for after consideration. The motion before him, as he understood it, was, that the preparation of the memorial be entrusted to the same committee as the parliamentary petition.

Mr. PEACOCK begged it to be understood that it was the sub-committee which drew the petition, and not the general committee which afterwards approved of it.

Mr. BEALE intended to refer the drawing of the memorial to the committee of 18 or 19 delegates, one from each district, and not to the sub-committee.

Mr. JACKSON said he wished to know whether the chairman or any of the delegates could state the amount of coal and gas consumed in districts which might be termed outside London. In the parliamentary petition he observed that there was a quotation from the report of the Government referees on the main drainage question, giving certain statistics drawn up by Mr. Lowe, the gas engineer of the Chartered Company, showing a return of the coal consumed, and the value of the gas made, together with the quantity in London. What he (Mr. Jackson) wished to know, and which he thought it very important they should specify in their memorial, if possible, was, whether this return of Mr. Lowe's included London and 8 or 10 miles round it, or whether it was defined, with respect to these statistics, as to how far London extended. For instance, whether the localities of the district boards, such as Wandsworth, which he represented, was included. He thought this was a very important point.

The CHAIRMAN said, certainly these observations were very important, but he was not aware himself of any statistical information existing upon the point referred to. His own opinion was, although Mr. Lowe was a very talented gas engineer, that his statistics were mere guess-work.

Mr. JACKSON thought they ought to know, with respect to his statistics, what was the definition of "London."

The CHAIRMAN thought that it must include only the districts of the thirteen metropolitan companies.

Mr. PETTER considered, before the memorial was presented to Sir George Grey, it was advisable that they should obtain returns and all necessary information upon the question.

Mr. JACKSON considered that the less delay they had in presenting the memorial the better. If they were to wait till they obtained the concurrence and statistics from all the district boards, it would create great delay.

The CHAIRMAN: I presume, in the memorial you intend to embrace each district's grievance, which is not the case in the petition to Parliament.

Mr. BEALE said that would, no doubt, be the case; and they would, of course, not think of applying to the Secretary of State without being prepared with their memorial.

The CHAIRMAN must really call gentlemen to order. The first point, and that which was before him, was whether they would appoint the committee.

Mr. HUGHES (of Westminster) wished to knew whether any time was fixed for the vestries and district boards to return the parliamentary petitions?

The CHAIRMAN: There was no time fixed, nor would they be returned. There was nothing for each of the district boards to do but to adopt the petition and present it, through their respective borough members, to Parliament.

Mr. HUGHES really thought the petition as adopted did not go far enough. It did not embrace the very points of grievance upon which the delegates set out in their movement with respect to the metropolitan gas companies.

The CHAIRMAN said he believed that Mr. Hughes was not present when the petition was adopted. It was resolved generally that, although there might be many special grievances applying to particular districts, it would not be politic to specify any particular grievance in the parliamentary petition. Although there might be a particular grievance applying to Marylebone or Southwark, or to this or that particular parish, it was thought better not to specify them in the petition to Parliament, but that that petition should be general. At the same time, it was left open to each parish or district, if it thought proper, to state any particular grievance it considered itself labouring under.

Mr. HUGHES said he was perfectly satisfied with this explanation, and would vote for the committee.

Mr. BEALE thought that if the committee commenced its labours immediately, they might by the end of the month be fortified with so much information as to be enabled to embody it in and complete their memorial.

Mr. WARING (St. Giles's) considered that there should be no waste of time in waiting for the decisions of the respective vestries and district boards as to the petition before they prepared their memorial, as no doubt the delegates could pretty well tell the feeling of the district boards. (Hear, hear.)

Mr. BEALE altered the words in his motion to "a" committee, and it was then put from the chair and carried unanimously. He then followed it up by moving the following:—"That the vestry of Marylebone be requested to arrange with the Home Secretary and the metropolitan members for the presentation of such memorial to the Home Secretary by the deputies from each vestry and district board."

Mr. GEESIN (St. James's), in seconding the resolution, said he differed with the gentleman from St. Giles's as to proceeding without the consent of the vestries. They no doubt pretty well knew the feeling of their respective vestries and district boards upon the general question, but he should not venture to presume to state that the vestry of St. James would approve of this petition. Their vestry would meet on the following day, and if the petition were sent to their vestry-clerk, Mr. Buzzard, that night, it could then be presented and decided on at once. With respect to the preparation of a memorial for presentation to the Secretary of State before they applied to know when he would receive the deputation, that was a very proper step of Mr. Beale. He (Mr. Geesin) had had in the course of his life a good deal to do with deputations to Secretaries of State and other Ministers, and he knew it was very frequently the case when a deputation was asked for, that a reply came to ask the parties proposing to wait upon the Minister to send, in the first place, their bill of fare. (Laughter.) This was in order that they might know what a deputation was coming about, and might be prepared to combat their arguments when they did come. He thought they should get their returns from the parish vestries as to the adoption of their petition without delay, and before they went to the Home Secretary. They must have everything cut and dried before they even asked for the deputation, for it very frequently happened that, if they sent on a Wednesday, the deputation might be fixed to attend by the Home Secretary on the following Friday or Saturday. He hoped, therefore, that they would not think of asking the Secretary of State to receive the deputation till they had their memorial prepared and all their statistics ready. (Hear, hear.)

The CHAIRMAN was afraid that Marylebone had lost its prestige, to hear the advice which their friend Mr. Geesin had just given them. As if, after the long practical experience the vestry of Marylebone had had with respect to Government deputations, that they should rush to Sir George Grey before they had all their facts ready to lay before him. ("Hear, hear," and a laugh.)

Mr. ELT said, if they waited till all the metropolitan parishes and districts had decided upon the parliamentary petition before they went with their memorial to Sir George Grey, they would waste much time. In the vestry of Islington the state of the *agenda* was such, that if this petition on the gas question waited till it came in its turn, it was probable that it might not come on for discussion for the next two months. (Laughter.) He thought that the committee should meet and set to work upon the subject of the memorial as early as possible. (Hear.)

Mr. WINGFIELD (of Marylebone) could not agree with the last speaker that the vestries or the district boards should allow two months, or even a fortnight, to go over their heads without discussing this petition. They had the power to move for a suspension of the standing orders and bring the matter on at once, or to call special meetings.

The CHAIRMAN said the vestry of Marylebone could not suggest to other boards to go out of their course.

Mr. WINGFIELD did not ask the vestry of Marylebone to do so. That meeting of delegates might, however, suggest such a course.

Mr. JACKSON hoped that they should all work harmoniously in this matter—(hear, hear)—and bring the petition forward in their respective boards as soon as they could. There was the metropolitan precept and other subjects, which some boards might consider more important to be discussed than even this gas question, important as it was. (Hear.) He thought that if they fixed that day three weeks they would by that time know the opinion of every vestry and district board in the metropolis.

Mr. FITCHEW (of Hammersmith) said each district would have its own grievance to consider, and they would most probably like to have it embodied in their petition while adopting the general petition as a basis. He thought that by having the expressed opinion of every vestry and district board before moving further, they would have a phalanx in themselves which could not be resisted.

Mr. TAVENER (Marylebone) hoped that, although any particular district at that moment might not feel the pressure of this arrangement amongst the gas companies, they would not be actuated by any selfish spirit, but that they would have public spirit enough to come forward and aid those districts which were oppressed. (Hear, hear.) Let them bear in mind that although only now partial the pressure might soon be general, and therefore he hoped that no district which was not at present immediately affected would be cold and apathetic in this movement. He trusted to find the entire metropolis and its suburbs united upon this question, and determined not to bow down their necks to be trampled on by any of the gas companies. (Hear, hear.)

Mr. JOHNSON (Fulham) quite agreed with the last speaker. He begged to tell them and all others that the district he represented had suffered and was suffering; and what they were suffering by this gas monopoly, other districts, unless they were equally energetic, were likely to suffer. (Hear.) He thought the whole difficulty could be easily got over by fixing a time for the reception of the opinions of the various boards on the parliamentary petition.

The CHAIRMAN said gentlemen appeared to have been arguing upon wrong premises. These petitions would not return to them; they had, as a body, sent them to the various vestries and district boards to deal with them as they thought proper, and to transmit them, with their corporate seals attached, to Parliament. (Hear, hear.)

Mr. JOHNSON intended his remarks to apply to the memorial.

The CHAIRMAN then put the resolution, and it was carried *nem. con.*

Mr. BEALE then moved the following as a third resolution:—"That such committee be requested to continue their labours, by communicating with municipal corporations, and public bodies and others, and metropolitan boards and vestries, and obtaining information as to gas-works in operation under municipal or local control, and on any other point they may deem essential in furtherance of the object in view, and report on the same at any future meeting."

Mr. REDFERN seconded this motion. He considered that they had quite sufficient evidence to go before the Home Secretary, with the fact that the districting of the various gas companies had a tendency to monopoly over the whole of the metropolis—(hear, hear)—but, at the same time, if other statistics were obtainable, it would be quite as well to have them. (Hear.)

The resolution was carried unanimously.

Mr. BEALE said he now thought that they had better have the names of the committee read over who were appointed from each parish, and then any that were omitted could be added.

Mr. KINTREA begged to remark that Dr. Challice attended their last meeting of committee, having been invited, not as a delegate from a district board, but as the head of a very powerful movement on this subject in Southwark.

The CHAIRMAN feared they could not admit the name of Dr. Challice, as they professed to be the representatives of some vestry or district board of the metropolis. If, therefore, the Southwark District Board would appoint Dr. Challice, he was sure they would be most happy to receive his co-operation. (Hear, hear.) Otherwise, they would be stultifying themselves and vitiate their proceedings, as they should not be that which they represented they were. (Hear, hear.)

The CHAIRMAN then read the names of the committee as follows:—

ST. MARYLEBONE—Dr. Bachhoffner, Mr. Freeth, and Mr. Hattersley.
ISLINGTON—Mr. Elt.
CAMBERWELL—Mr. Kintrea.
FULHAM—Mr. Johnson.
HAMMERSMITH—Mr. Fitchew.
ST. MARTIN'S-IN-THE-FIELDS—Mr. Petter.
LIMEHOUSE—Mr. Skillett.
HACKNEY—Mr. Matson.
ST. JAMES'S—Mr. Beale and Mr. Geesin.
ST. PANCRAS—Mr. Farrer and Mr. Cameron.
WESTMINSTER—Mr. Clarke.
HOLBORN—Mr. Mayes.
LAMBETH—Mr. Stratton.
NEWINGTON—Mr. Redfern.
CLERKENWELL—Mr. Phillips.
WANDSWORTH—Mr. Reynolds.
STRAND—Mr. Walker and Mr. Carr.
PADDINGTON—Mr. Roche.
MILE END OLD TOWN—Mr. Hollingsworth.
With power to add to their number.

Mr. KINTREA understood that in the memorial the grievances of every district would be stated.

The CHAIRMAN: No doubt the committee will take care that the grievances of every parish and district are duly represented in that memorial. (Hear, hear.)

Mr. REDFERN wished to ask a question. He saw that Bermondsey, which had very serious grievances to complain of, was neither represented at that conference, or on the committee. Would any parish or district which had not yet sent representatives be entitled hereafter to send a delegate to represent them in this committee?

The CHAIRMAN, speaking for himself, should say decidedly so. (Cheers.)

The names of several gentlemen were then added to the committee.

Mr. EDWARDS (of Lewisham) said their board had not appointed him, but could he be admitted to the committee?

The CHAIRMAN said he could not, unless he was regularly appointed. He was out of court. (Laughter.)

Mr. HOLLINGSWORTH (Mile End) said it appeared to him that there were several important metropolitan parishes and districts not represented at that conference, many of which, to his own knowledge, had very serious grievances to complain of with regard to this gas arrangement and the gas supply generally; and he thought that some steps should be taken to give them proper information of their meetings, and state that they should be happy to see them present at their conference, and to join this committee, in order that they might have their grievances properly explained and brought before Parliament. Under these circumstances he begged leave to move the following as a resolution:—"That those metropolitan parishes at present unrepresented at this conference be written to and informed that the conference will be happy to see them represented here and upon the committee just formed, to the end that their complaints be fully explained."

The motion having been seconded,

The CHAIRMAN begged to assure the gentleman who proposed this resolution that Mr. Greenwell, the zealous and indefatigable vestry-clerk of Marylebone, had duly communicated with every vestry and district board, forwarding them all the resolutions and documents, as well as inviting them to send deputations to the conference. (Hear, hear.)

Mr. GREENWELL said he had forwarded notices regularly to the clerks and secretaries of every board enumerated in Schedules A and B to the Metropolis Local Management Act, which must be presumed to comprise every one in the metropolis. (Hear, hear.)

Mr. KINTREA could bear his testimony to the untiring zeal with which Mr. Greenwell had discharged the duty of honorary secretary to that conference and the committee; and as every parish had been sent to, it must be presumed that they had either no grievance to be redressed, or, having one, they did not care to have it redressed. (Hear, hear.) While upon his legs, he wished to do an act of justice to the Phœnix Gas Company, which the secretary of that company was very anxious about, although he looked upon it himself as most trivial. At their last meeting, he (Mr. Kintrea) made a statement that the Phœnix Company charged in Camberwell £5. 7s. 6d. for the public lights. He had been reminded that there were 47 only charged at £4. 17s. 6d. They formerly paid for some of their lights but £3. 15s.; but he was still correct in saying that for the larger proportion they paid £5. 7s. 6d. per light. (Hear.)

The CHAIRMAN said a curious fact had just been put into his hand, showing that in the adjoining parish of St. Pancras, the public lights amounted to 2500 lamps, at £5 per lamp, costing £12,500 per annum. (Hear.)

Mr. Hollingsworth's resolution was then negatived on a show of hands by 15 to 12, and arrangements having been made for the meeting of the committee,

A vote of thanks to the chairman terminated the proceedings.

SUFFOCATION FROM GAS.

On Wednesday last an inquest was held at the Fleece Inn, Halifax, on the body of Sarah Jackson, aged 40, who was suffocated by the escape of gas from a main in Dungeon Street into the cottage in which she resided.

It appeared that the deceased and a man named Bedford, with his son, occupied the house in Dungeon Street, a short street which connects Pellon Lane and Gibbet Street. The house, which is one of a comparatively new row of buildings, contained a cellar, a room on a level with the street, and two chambers, a back and a front one. The parties seem to have habitually

slept in the chamber towards the street. No meter or gas piping exists in connexion with the house, and yet on Monday, the 11th inst., the smell of gas was very strong in every part of this and the adjoining ones. So strong, indeed, were the symptoms of an escape of gas, that the inmates were frightened to light a candle; yet, strange to say, no alarm was given to the proper authorities. At ten o'clock that night the deceased and the boy retired to rest. The man, Bedford, did not return home until two o'clock on Tuesday morning, when deceased complained of being almost suffocated; but, owing to the intoxicated state of Bedford, he was unable to render her any assistance, or raise an alarm. Indeed, he was so much the worse for liquor that he went to bed himself and was found some hours afterwards in an apparently dying state along with his son. The woman had been dead some hours.

The jury having inspected the premises, the following evidence was adduced:—

Samuel Bedford, one of the surviving sufferers (whose depositions were taken at his bedside), said he went home about two o'clock on Tuesday morning. When he got up stairs the deceased said to him, "Sam, I am nearly suffocated;" but he was intoxicated, and could not relieve her. [The poor woman must have died very soon after this time, as she appeared to have been dead some hours when the house was entered about half-past eight o'clock the same morning.] For some time past they had perceived a smell of gas in the house, and they could not sit upon the hearthstone on account of it. The deceased had complained about it to the landlord of the Fleece Inn, but not to any one at the Town Hall.

George Thomas and *Elizabeth Hutchinson* having given evidence, an elderly woman, named *Alice Lindill*, was examined: She said she lived next door to the deceased. There was a strong smell of gas in her house on Monday night, and she did not think it safe to use a candle, either to go down into the cellar or to go upstairs to bed. She believed herself and the other inmates of the house would have been suffocated, but they slept in the back part of the house instead of the front. The deceased came into her house on Monday night about half-past nine, complaining about a smell of gas. Witness heard the deceased and the little boy go to bed about ten o'clock. In the bedroom of deceased's house there was no outlet for the gas, the door being shut and the fireplace plastered up, and the top of the window-sash being covered by a sand-bag.

Mr. *Jubb*, the surgeon who had attended the parties, deposed to the circumstances under which he was called in, and to the symptoms manifested by the deceased. He attributed her death to asphyxia, or suffocation, from the effects of the gas, and the preservation of Bedford's life to the stimulating properties of the whiskey he had taken, and which to a certain extent had neutralized the effects of the gas. At the request of the coroner, he mentioned the remedies he had employed for the restoration of the man and boy. He said his greatest remedy was the dashing of cold water upon the persons affected, the sudden shock having a rousing effect upon the system. In addition to this, he administered stimulants of brandy and ammonia, and applied mustard plasters to the calves of the legs. But the greatest cause of recovery he attributed to the cold water, every dash of which seemed to rouse the man. He used the same remedies for both man and boy, but they required to be more perseveringly adhered to in the case of the former.

Mr. *Stevenson*, C.E., the borough engineer, said he heard of the accident from Mr. Superintendent Pearson about nine o'clock, and was on the spot about twenty-five minutes afterwards. On entering the house, he found a strong smell of gas pervading the whole place. The smell was especially strong at the top of the cellar steps—so strong that he would have considered it dangerous to descend with a light. He supposed, of course, that the main pipe in the street had broken, and he directed that the valves at each end of the street should be closed, and also directed that a number of men should open down upon the pipe. It was then discovered that the case of one of the valves (the one now produced) was fractured. This valve was about 12 yards lower down in the street than the house where deceased lay—on *lower ground* than the dwelling-house. The gas, escaping through the fractured valve, got into an old and disused drain, which ran immediately alongside the pipes, and which drain had been cut off and closed opposite Bedford's house. The gas travelled up the old drain, and being stopped by the stoppage of the drain itself, found its way into the house of Bedford and those adjoining. This was all he could tell as to the cause of the accident. He had the valve cut out immediately, and from an examination he was prepared to state positively that the fracture arose from an imperfection in the casting, which could not be detected before the valve was fixed. [The valve was here brought in, and Mr. Stevenson showed most clearly that an original defect existed on the inner side of the casting of the case. A deposit of gas tar lay up to within a slight distance of the outer edge, showing that the crack had been there some time, and that the casting had held together merely by a shell or skin, or rind, as it were, of the piece. The crack would not be discoverable by examination, and it appears that the shell held tightly under the gas trial to which the valves are put at the town's works, before being used.] The valve had been in use for nine months. All the valves were passed and examined before they were put down. There had been a slight escape for some time, but when the valve broke it became serious. The valves were made by a house in Dudley; the makers professed to test them by hydraulic pressure, and they were tested for gas by the townsmen. If this valve had been put to the hydraulic test it must have given way. The corporation bought valves from another place now—Messrs. Clapham's, Keighley. If there had been no old drain, or if it had been completely filled up, there would have been no fatal accident, for the smell would have been discovered in the street. The makers of the valve were men of great repute, and the corporation paid the highest price. In the course of 17 years' experience he had never seen an instance of a valve breaking in this way before. It was not customary to test valves received from the makers, not even for gas, but the corporation adopted the plan of testing for gas as an additional precaution. The street had not been disturbed by opening for drains, or other purposes, but the final fracture—the fracture of the "skin"—might have been caused by the traffic over the street. The trench in which the valve itself was, was protected by a wall on each side and a casing on the top of it. Old drains in the town were sometimes filled, but many were not. He thought they ought to have been filled up as the new ones proceeded; it was the usual custom. One injurious consequence of not filling up the old drains was the making of a way for gas into the houses. He would like it to be known that in five minutes after he reached the spot the gas was shut off from Bedford's house and the whole street; the valve, though broken, answered the purpose of shutting off the gas.

This was the whole of the evidence produced.

The CORONER summed up, and said he must leave it to the jury to decide. In one respect he did so with satisfaction, for he could not put his finger upon anybody who could be criminally to blame in the matter. Certainly, if complaints had been made to the authorities, and they had not been attended to, great blame would have attached to them, if not criminality. It was not so in this case. It seemed almost unaccountable that, when the smell of gas was so strong in the house, the inmates had not attended to it. The fact probably was that they did not know of any danger from gas except that of explosion; the other consequences they were entirely ignorant of. Mr. Stevenson's evidence was clear, and acquitted the authorities of blame. He could not say so much for the makers of the valve. It ought to have been tested, and if so its defects would have been discovered.

After a lengthy consultation with the coroner, the jury returned the following verdict:—"That the deceased, Sarah Jackson, was found dead in her house in Dungeon Street, and that the said Sarah Jackson was suffocated by coal gas escaping from or through a fracture in a gas-valve passing by or through an old drain into the house of the said Sarah Jackson; and the jurors say that the said fracture arose from a defect in the casting of such valve, and they consider that the makers thereof are highly censurable for such defective casting, and for not having had the same properly tested; and the jurors also say that, if the old drain had been filled up, as is usual in case of new drainage works, the death of the said Sarah Jackson would have been prevented; and they strongly call the attention of the mayor and corporation to the necessity of having all old drains filled up."

THE LIVERPOOL TOWN COUNCIL AND THE GAS COMPANY.

WEDNESDAY, JAN. 6.

At the Monthly Meeting of the Town Council, held this day, the DEPUTY TOWN-CLERK read the proceedings of the watch, lighting, and fire committee. When he had come to that portion of the report which contained a lengthened correspondence with the committee from Mr. Newlands, the borough engineer, the gas company, the gas inspector, &c., relative to a statement made by Mr. Kitchen, at the last meeting of the council, to the effect that the gas inspector had reported that he had erected some public lamps at less cost than the gas company had charged,

The MAYOR suggested that, as the discussion of this question, if entered upon, would probably occupy the remainder of the day, it would be better to refer it to a joint committee of the members of the gas committee and the watch and lighting committees.

Mr. HODSON moved that the entire correspondence be referred to a joint committee, as had been suggested by the mayor.

Mr. KITCHEN seconded the motion, and observed that the inspector had, since the last meeting of the council, assured him of the accuracy of his former statement with reference to the cost of erecting the lamps.

Mr. JEFFERY said he believed justice would be done to all parties concerned in this matter, if the question were referred to a joint committee, and let that committee appoint a sub-committee to go into the details, and come to a correct conclusion on the point. If this question were now discussed, it would absorb the remainder of the day, and at the end they would be just where they started—with this exception, that they would be compelled to refer it to a committee.

Mr. Alderman BENNETT maintained that a more honourable body of men did not exist, or a better managed company was not in the whole of her Majesty's dominions than the Liverpool gas company. He would feel inclined to agree to Mr. Hodson's proposition to refer the matter to the two committees; but he thought, in the first place, they were bound to hear the letters read.

Mr. BENNETT said it struck him that they were mystifying a very simple matter. In the first place, a grave and serious charge was made against the gas company, and it was either true or it was false. The borough engineer, whom he supposed to be a gentleman standing between the two parties, gave his report; and from his thorough knowledge of the subject, he should be strongly guided by that report. The chairman of the corporation gas committee, in seconding Mr. Hodson's proposal, had said that the gas inspector was still prepared to substantiate the information which Mr. Kitchen, the chairman of that committee, communicated to the council; so that it would go forth to-morrow that a statement, which might have been hastily put forth originally, was coolly repeated after a month's consideration. Now he, for one, felt that if he were a member of that company, he should feel it due to himself not to rest one moment longer than it was possible under a stigma so injurious to private character. (Hear, hear.)

Mr. ROBERTSON said, when they looked to the circumstances of this case, he thought that justice demanded that this report should be read. The gas committee of the corporation, in the first instance, got a report from the inspector of meters. That report was sent to the watch committee, but before they could investigate it the matter was brought forward at last council. The borough engineer had now given an answer to those charges, and in justice to him his report should be read.

Mr. Beckwith, Mr. Alderman Cooper, and Mr. Alderman Parker here rose simultaneously to address the council amid some merriment.

Mr. BECKWITH: I am in possession.

Alderman PARKER: No, sir, I am in possession. (Laughter.)

The MAYOR: Mr. Parker rose first.

Alderman PARKER then said that he thought the mayor's suggestion a very good one—to refer the matter to a joint committee—and he hoped that course would be taken. (Cries of "Read, read.")

Alderman COOPER: The chairman of the gas committee of the corporation has made a statement—which has gone forth—against the gas company, and repeats that statement again to-day. I have no hesitation in saying that I believe it to be totally unfounded, and I do ask this council, in justice to the gas company, that they should allow these proceedings to be read.

Mr. S. HOLME said the proper course unquestionably was to read the whole of these reports. Let all discussion be deferred, and then let the reports be sent to the various committees for investigation. (Hear hear.)

The DEPUTY TOWN-CLERK then read the following documents:—

(Copy.)

COST OF LIGHTING UP LARGE LAMPS.

December 5, 1857.

Sir,—In accordance with the resolution of the watch committee requesting me to report upon the subject of a statement made by the inspector of gas meters to the gas supply committee, respecting the comparative expense of putting up the large lamps, I have to state—

1. The gas inspector represents that two of these lamps were fitted up by himself at an expense, including workmanship at the governors, of £10. 14s. 5d. in the one case, and £11. 15s. in the other; and that the expense of fitting up each of the lamps previously erected was £23. 2s., exclusive of the workmanship at the governors. The short reply is, that this statement is contrary to the fact, and involves a suppression of important circumstances materially affecting the question of cost.

2. None of the lamps have been fitted up by the inspector, or under his direction. In every case the work has been done by the gas company, under my direction only; and if there were any actual difference in the price of the work, the excess or abatement would rest entirely with the company and myself. But the facts are that, in the first instance, part of the fittings for the whole of the sixteen lamps in stock was made according to the original drawings, and paid for in the bills delivered by the

company at the time the first eleven lamps were erected, and that expense will have to be spread over the whole sixteen when they shall be erected.

The inspector, without inquiry, in ignorance of this fact, and having nothing to do with the matter, has improperly appropriated the whole cost of the fittings for the sixteen to the eleven, and has not allowed anything on this head in calculating the cost of the last two to which he particularly refers.

3. The committee will remember that the lighting of the large lamps was a novel experiment altogether, even with the experience of the gas company. Upon conference with the gas engineer, it was at first determined to try a single ring of lights, and a few lamps were so fitted up. We then found that the arrangement was capable of improvement; and, with the sanction of the lighting committee, a double ring of burners was adopted, so arranged that either one or both of the rings could be worked at pleasure, the object being to afford a strong light during the hours of business, and reduce the expenditure of gas after midnight. To effect this desirable change it became necessary to remove all the pipes, and substitute a double set instead. The effect of this was to reduce the consumption of gas considerably, and correspondingly reduce the company's charge for supply.

4. The whole cost of the above arrangement was included on the gas company's general charges. The last two lamps were erected with the benefit of this experience, and, consequently, that expense was saved with them, in addition to their being supplied with the fittings which had been previously paid for.

5. Having thus determined on the principle of lighting the lamps, it was ascertained that the pressure of gas was not uniform throughout the town, and, consequently, it became necessary to provide some effectual test which should be a standard gauge between the committee and the company to ascertain the quantity of gas used. A meter was, for this purpose, attached to the lamp in Scotland Road, involving the necessary alterations in the pipeage, and, on the 21st of March last, your engineer and cashier, upon the whole subject being referred to them by the lighting committee, advised that a meter and regulator should be attached to each lamp, on the ground that the cost of lighting would still further be diminished, and any risk of disagreement with the gas company as to quantity effectually obviated. The committee directed this suggestion to be carried out in the lamps already erected and those to be erected. The cost of all these alterations was also included in the gas company's general charges, and was, consequently, saved as to the remainder, including the two to which the gas supply committee refer.

6. It was utterly impossible for any person, whatever his practical experience, to arrive at these conclusions, of which we are now reaping the benefit, without actual experiments, as there were previously no data on which to proceed, and the result, with which no one has had anything to do, except myself, who ordered the work, and the gas company who execute it, is a saving of full 50 per cent. in the cost of lighting.

7. On the appointment of the gas inspector I thought it due to him to inquire in what position the meters could be placed so as to be most convenient for his examination, and I asked him to obtain the best regulators known to him. He obtained them, and they were placed, together with the meters, at such part of the basement of the lamp-pillar as he wished.

8. I have to assure the committee that whatever blame or praise may accrue from the erection and fitting up of the large lamps applies exclusively to the gas company and myself. And the gas inspector has not had anything to do with the business except as above stated.

9. As the gas company are therefore affected by the statement which the gas inspector has made, I have thought it right, before submitting this report to the lighting committee, to read it to Mr. Alfred King, and he is prepared to confirm every statement it contains.—I have the honour to be, Sir, your most obedient servant,

(Signed) JAMES NEWLANDS.

To the Chairman of the Lighting Committee.

Gas-Meter Department, Public Offices, Cornwallis Street, Jan 2, 1858.

Sir,—In compliance with your directions, I beg to submit my report to the statements of the borough engineer respecting the comparative cost of fitting up the large lamps which have been erected by order of the corporation.

I will answer the statements *seriatim*:—

1. I have not misrepresented the fact of fitting up these two lamps, nor have I suppressed any circumstance connected therewith.

2. The two lamps above referred to were fitted up by the gas company, but under my direction (see gas company's bills annexed, Nos. 2 and 3), but the cost of these have nothing whatever to do with lamps previously fitted and charged for by the gas company.

Mr. Newlands' statement goes to show that the corporation have paid for the sixteen lamps originally intended to have been fitted, when there were really only eleven lamps fitted. To the two alluded to (see copy of gas company's bill, No. 1), this brings me to that part of my statement where I assert that each lamp cost on an average £23. 4s. 4d. exclusive of alterations upon these eleven lamps, for which the gas company make a further charge of £36. 12s. 5d., or £3. 6s. 7d. extra, making each lamp to cost £26. 10s. 10d. (see amount of bill No. 4).

3. The novelty and want of experience in fitting these lamps and consequent alterations, cannot account for the excessive charges of the gas company. The most that can be made of this is, that a portion of the supply-pipe, inside the column, would have to be taken down, to introduce a second and small pipe for the second ring burner, at a cost of not more than 24s. each lamp—that is, supposing the whole eleven lamps had been experimented upon.

4. The benefit of experience and re-arrangement that the last two lamps derive, which is said to be in the gas company's general charges, would be in the labour only, say about 10s. each; but I deny they were supplied with any fittings that had been previously paid for (see copy of account 2 and 3).

5. The whole of this, as regards the fittings and fixing meters and governors, is in error; the gas company has been paid for the extras (see amount of bills No. 4).

6 and 7. Mr. Newlands admits he consulted your inspector, as to the meter and regulators to be fixed to the lamps in question. The committee can draw its own conclusion as to the whole of the statement, and from whence came the suggestions.

8. Your inspector assures the committee that he suggested and directed the whole of the alterations; and, therefore, the praise, but no blame, is due to him.

9. Your inspector regrets that the gas company's charges, before being paid, were not gone into by himself and Mr. Newlands, when, perhaps, the committee's valuable time would have been saved in investigation.

I have the honour to be, Sir, your most obedient servant,

DANIEL HORTON.

Liverpool United Gaslight Company's Offices, Newington, December 26, 1857.

TO THE WORSHIPFUL THE MAYOR.

Sir,—My attention has been called to the observations made by Mr. Kitchen at the council held on the 2nd instant, on his moving the adoption of the proceedings of the committee on the supply of gas.

There are two subjects among others to which Mr. Kitchen referred, in respect of which I regret that he should have made assertions which are not founded in fact.

The first has reference to the cost of two large lamps, compared with eleven previously erected; and the second relates to the number of meters at the office in Cornwallis Street.

Mr. Kitchen is reported to have said, "With regard to those large public lamps erected in the squares of the town, the committee had before them an account furnished by the gas company for eleven lamps, amounting to £291; since that two lamps had been fitted up under the superintendence of the inspector, and the expense only came to £11. 4s. 9d. per lamp, whereas £26. 10s. was charged by the gas company."

I shall make but few observations on this, as the council will have before them a report from the borough engineer to the watch committee, which he has done Mr. King, the gas company's engineer, the courtesy to send for his perusal, and which I beg may be read in connexion with this letter.

It would appear, from Mr. Kitchen's remarks above quoted, that the two lamps referred to had been "fitted up under the superintendence of the inspector" by some other party than the gas company, whereas the fact is that two lamps were fitted up by the gas company under precisely the same circumstances as the eleven, the company supplying labour and materials, and executing the work under the direction and superintendence of the borough engineer, to whose department the directors had supposed such matters especially appertained.

On the second subject Mr. Kitchen is reported to have said, "There was another point which he wished the public to understand, namely, that they were perfectly competent to turn out of the office in Cornwallis Street something like 70 meters per day. The gas company had not furnished them with anything so large of late, and he believed they were now sending out meters not certified, and not stamped, and at the same time representing to the parties to whom they were sent that it was because the inspector could not turn them out quick enough for the demand."

It is true, as Mr. Kitchen asserted, that the gas company have supplied meters which have not been tested or certified by the inspector; but they have never done this so long as a certified meter remained in their stores; and it will be seen in a subsequent part of this letter, that the company not only did not attempt to conceal this fact, but actually communicated it to the chairman of the gas supply committee. On several occasions the company had only the alternative of supplying uncertified meters, or of leaving some of the consumers without any light. The amount of injury which the public has sustained from this cause may be estimated from the following facts:—That of 4411 meters sent to be tested by the inspector, although a few have been returned on account of injuries received in the carriage, or for trifling defects, only *two* have been rejected on account of *erroneous registration* of these two rejected meters; one, which was in an unfinished state, had, by an oversight, been placed among those which were arranged for being sent to Cornwallis Street; the other was a larger meter, which was pronounced by the inspector to be erroneous to an extent quite beyond the limits of probability. This meter, on being tested immediately after its rejection by Mr. Horton, was found to be perfectly accurate in its registration. Mr. Horton was invited to witness the proof at the company's workshops; but, as he did not come, the meter was returned unaltered, and was then certified as correct by the inspector.

It has been the anxious desire of the directors and their engineer to afford every facility to the office in Cornwallis Street for proving the meters; and Mr. King has rendered important service to the committee by furnishing, at their request, an apparatus, of his invention, for accurately measuring a cubic foot.

The following correspondence, it is hoped, will convince the council that the company's engineer has most promptly given to the committee not only his assistance, but all the information which has been acquired by him.

On the 25th of August last, Mr. King received the following note from Mr. Kitchen:—

"Mr. Horton informs me that we shall have to make provision to test about 60 or 70 gas-meters per day, which is more than our present means will enable us to do. Please inform me if this be so, and, at the same time, I shall be glad to know whether you have two 5-feet gasholders; if not, how soon you could make them, and the price."

On the 26th of August last Mr. King sent the following answer to Mr. Kitchen:—

"In reply to your note, I beg to state that since the 10th instant (being the day the inspector commenced his operations), we have sent 281 meters to Cornwallis Street, and 201 have been returned, so that 80 are now in Mr. Horton's hands. During the same period we have required 507 meters, so that our demand is on an average about 42 meters per diem, while Mr. Horton's supply is only about 17. On referring to our books I find, from the 28th of October to the 3rd of November, 1856, we sent out 383 meters, or 64 daily. From these data I think Mr. Horton should be provided with the means for testing at least 50 meters a day. I am now making two 5-feet gasholders for our own use, but I shall very willingly give them up for your service; they will be finished in three weeks, and the price of each will be £16."

The two gasholders were not finished at as early a period as Mr. King expected, but were fixed and ready for use on the 16th of October last. Mr. Kitchen, in his note to Mr. King, acknowledges that the establishment in Cornwallis Street was not equal to the requirements made upon it; and Mr. King, in his reply states, that at that time the inspector was only testing at the average rate of 17 daily. As the additional gasholders were not made until the middle of October last, the want of capability to supply the demand must have continued to that time by Mr. Kitchen's own showing; but ever since the 2nd of December instant, the day Mr. Kitchen announced to the council that the inspector was prepared to prove "something like 70 meters a day," the average has only been 53; while, during the same period, the average number in the inspector's office has been 117, and never less than 88.

The directors are so conscious of the advantage which the company derives from the testing of meters by an officer appointed by the corporation, that the council may rest assured that they will do all in their power to facilitate rather than retard his operations; and therefore they do feel, after the time and attention which Mr. King has devoted to the service of the committee of gas supply, in correcting and improving the testing apparatus, that they have great reason for complaint that Mr. Kitchen should have made these unfounded assertions. With respect to the public clocks, to which Mr. Kitchen also referred, I may observe that the company has executed the orders which have been given; and I may add that the public will hardly be satisfied in having obtained a reduction in cost at the expense of efficiency.

I am, your Worship's very faithfully,

JOSEPH COOPER, Chairman.

Mr. BRANCKER said he had no objection that so much of these proceedings as belonged to the watch committee should be referred to them. So far as the fitting up of large lamps, and the expense consequent upon it, he had no objection to that being referred to the watch committee; but there were other matters involved in the question, with which that committee had nothing whatever to do.

It was then agreed to refer the entire matter to the corporation gas committee and the watch and lighting committee for consideration.

THE DOVER WATER SUPPLY.

At a Meeting of the Dover Local Board of Health, held on the 31st ult.,

The CLERK presented a letter he had received from Messrs. Simpson and Co., in reply to a communication he had addressed to them in pursuance of the committee's order asking them the cost of measures for the preservation of the engine at the water-works, by increasing the air vessel or any other means they might deem effectual. Messrs. Simpson, in reply, proposed to fix a donkey engine for charging the present air vessel, and also to enlarge the air vessel itself. A calamitous contingency would be best avoided by adopting both these suggestions; but if the local board resolved to employ only one, they considered the first, the erection of the auxiliary engine, as the most important. The cost of the donkey engine and air pumps, with pipes, &c., fixed and set to work, would be £69; and the expense of adding an extra length to the air vessel would be £48.

A discussion ensued, in the course of which

Mr. ROBINSON remarked that the cost of the water-works was getting beyond a "solemn joke," and that what with headings and footings, and engineers and donkeys, he was becoming almost bewildered. (Laughter.)

The TOWN-CLERK, in reply to some reflections that were cast on Messrs. Simpson and Co., said that Messrs. Simpson and Co. were not open to blame because the machinery required additional outlay. Those gentlemen had contracted to supply engines to lift water 180 feet, but those very engines were now lifting from a depth of 240 feet; and it was not to be expected that any machinery, without risk to its efficiency, could discharge a task so much beyond what it was designed for. The only persons to blame were the engineers who designed the works, who ought to have properly ascertained the depth at which a proper supply of water was to be found.

The SURVEYOR said that the true remedy for the present state of things was to get more water, and so be enabled to raise the pumps. The donkey engine and the enlargement of the air vessel were perhaps the only things that could be done at present; but it was beyond controversy that both these measures were but make-shifts.

Alderman ASTLEY moved that the donkey engine be obtained according to the estimate furnished by Messrs. Simpson and Co.

Alderman POUND seconded the proposition, which, however, upon a division, was negatived, the proposer and seconder alone voting for the motion, and three gentlemen holding up their hands against it. No other proposition was submitted.

This decision was taken into consideration at a meeting of the town council held on the following day, when, after some discussion,

The council reversed the decision of the managing committee, a motion by Mr. DUKE, that the donkey engine be supplied as proposed by Messrs. Simpson, being seconded by Mr. WESTON, and carried *nem. con.*

Mr. MOXON observed that the council would ultimately have to remove the water-works engines from their present site to the valley below.

REPORT OF MR. GURNEY TO THE FIRST COMMISSIONER OF WORKS ON THE STATE OF THE RIVER THAMES.

House of Commons, Nov. 3, 1857.

SIR,—In accordance with your instructions of the 6th of August last (3584), that I should explain to you the means referred to in my letter of the 3rd of the same month for preventing a further pollution of the river and the atmosphere about the Houses of Parliament during the construction of any system of drainage that may be carried out, I respectfully beg to lay before you the following observations:—

My remarks will extend farther than I originally intended, for I expected to find the nature and properties of sewerage, the conditions and hydrodynamic disturbances of the river, fully investigated and laid down, so that I should only have had briefly to refer to them, to enable me to explain the mode by which a further pollution of the river and atmosphere of the Houses of Parliament may be prevented. I can find no such information. It is, however, essentially necessary to the question; for, unless the true cause why sewerage is retained against the downcast influence of tide and a powerful freshet be clearly understood, no plan can be devised for preventing its further pollution with any hope of success. I have, therefore, deemed it expedient to go into the whole question.

Sewerage, as it comes from the drains, may be divided into three parts—the liquid, solid, and gaseous; or *soluble*, *insoluble*, and *aëriform*.

Many mistaken views with regard to the state of *insoluble sewerage* in the river are entertained; amongst the rest, it is thought by some that it is specifically lighter than water, and floats on its surface. Possibly this mistake may have been occasioned by observing recent sewerage to float when first thrown into water, and not observing its altered condition after maceration. Mistakes are often made by the use of terms which may be construed either in their literal sense, or taken in their technical meaning. Sewerage is said "to float up and down with the tide." The experiments made with floating bodies from time to time are calculated to lead to the same mistake; the floats are supposed to represent sewerage, and to point out the course it would take when thrown into the water. It is thought these experiments could not have been made to show the cast of sewerage unless it floated in the river. Be this as it may, under some circumstances or other, there is an impression that sewerage in the Thames is specifically lighter than water, and that it really floats up and down with the tide. Any error on this point is fatal to our inquiry, and must be so to any other connected with the purification of the Thames.

I find the specific gravity of insoluble sewerage to be 1·325: it will sink at the rate of about a foot per minute in still water or in slow currents. It will also precipitate in stronger currents, moving in parallel lines: at a greater rate than 170 feet per minute it will not precipitate; because, in these currents, the force of agitation, or rather convolution, is greater than the force of gravitation.

In currents above 170 feet per minute, the sewerage is always kept in a state of mechanical mixture. It will sink in the slack at all times of tide along shore; and on the turn of tide, at high water, when it becomes quiescent, or nearly so, sewerage will precipitate in every part of the river. Thus, while in the middle of the Thames, where the tide is running full, it is kept in mechanical mixture, forming part of the stream, in the slack, retrogrades, and eddies along shore it will invariably sink.

The Thames is a tidal river, and, like all tidal rivers, subject to peculiar disturbance. The disturbance is greater on the flow than on the ebb. On the flow there are two forces operating in opposite directions, the force of momentum of the freshet downward, and the force of the tide upwards. These contending forces are under *the first law of motion*, and of necessity produce considerable agitation; the convolutions of the conflux are continued along the river, so far as it flows. The ebb tide, on the contrary, is under very different circumstances; at the turn of tide at high water, the whole water, both freshet and tide, is gradually drawn away in one uninterrupted stream, by the gradual sinking of the tidal column at the Nore; it quietly falls away: there is no opposing force, no contention, no convolution.

On the flow, the tide first sets up along shore, and then curves outwards into the middle of the river, stirring up and taking the deposited sewerage with it. It takes this course because there is less opposition: the momentum of the freshet is more powerful in the centre. The tide may be seen first running along through the slack and eddies, stirring up the deposited sewerage, and carrying it into the stream, where it is kept mechanically mixed; rolling about under the laws of convolution, and carried up, as part of the current, so far as the tide flows.

The water appears more foul in some parts of the river than in others. At high water there is little or nothing offensive to be seen in the middle of the river; the water on the surface will look free from sewerage, but towards the sides it will always look foul. At half tide, however, the river will be foul in every part. I always observed that where the currents began to slacken the water began to brighten.

The same law which occasions a larger quantity of sewerage to collect in one part of the river than another causes its permanent retention in other places.

The tide at Westminster Bridge runs up 5·10 hours and down 7·20; or, more correctly speaking, it runs up and down in equal times: about two hours extra downcast is due to the freshet. The tide rises about 21 inches at Westminster Bridge before it begins to run; in winter it frequently rises so high as from three to four feet. The level rises much higher, up the river, before a sensible movement can be seen. At Putney Bridge, in winter, the tide often rises to the level of high water before the current sensibly runs up at all. These variations are due to the quantity of freshet. When the river water coming down raises the level at a certain point as fast as the tidal water coming up, there will be no current at this spot, one way or the other. This point may be called the "*freshet head*," the point where the river water heads or balances the force of tide; and this term will be used to express it in the following remarks. The position of the freshet head varies in neap and spring tides; it also varies by a more or less quantity of rain. Within the range of the freshet head, at Putney, the up tide overcomes the freshet so slowly, even in summer, that a towing-path is found necessary on the side of the river to tow up the barges by horses.

The tide off the Terrace at the Houses of Parliament runs at an average rate of from three to four miles per hour in the middle of the stream; towards the sides its rate is considerably less; within eight yards of the shore it never runs at a rate exceeding 78 feet per minute; nearer to the shore it generally falls into a slack; at from two to four yards off the shore the tide is either still or takes an opposite direction; when the stream runs up, the eddies run down; when the stream runs down, the eddies run up, as is the case in all tidal rivers.

Between these currents the natural water brattice is formed, with a series of recesses or little cesspools, running along shore; within these brattices a large quantity of sewerage is always precipitated, and permanently retained. On looking along the river, two black lines may generally be seen stretching along the sides; these black lines are the series of cesspools just adverted to, filled with sewerage.

A few words in explanation of the term "water brattice" may be necessary, because it is a borrowed term. In mining, where there is only one shaft, it is often divided by a boarded partition, running up and down the middle, dividing the shaft into two parts for ventilation. This partition is called "a brattice;" the vitiated air is made to pass up one side, and fresh air to go down the other. These retrograde currents will sometimes form of themselves without any artificial division. The plane or plate of air at rest between the up and down current I have in another place called the "*pneumatic*," or "*natural brattice*." The plate of water at rest between two retrograde currents I have called the "*water brattice;*" and in this sense the term will be used in the following remarks.

To ascertain accurately the proportion of insoluble sewerage contained in different parts of the river-water, the following experiments were made to test them by precipitation, and also by aberration of light. A glass cylindrical vessel, 10-feet column, and graduated in tenths of an inch, was filled with water taken from different parts of the river, and allowed to stand till all the sewerage had precipitated to the bottom of the column. The quantity of sewerage deposited was then read off by the graduations. The water taken at half tide, in the middle of the river, opposite the terrace, gave a deposit of 18°; water from half way between the middle and the shore 21°; within 20 yards of the shore 26°; within three yards of the shore 38°. At high water, taken from the middle of the river, it gave no perceptible precipitate; water from half way between the middle and the shore gave 18°; within 20 yards 25°; within three yards of the shore 40°. The water in all these cases was taken from the surface. Water was now taken in the middle, 15 feet below the surface; and, on submitting it to precipitation, it gave a deposit of 19°; half way 21°; within 20 yards of the shore, at a depth of three feet, it gave a deposit of 37°. The next set of experiments were made at the period of low water. The middle of the river seemed perfectly clear, but the sides very black and foul; water from the middle gave no sensible deposit, whilst from within three yards of the shore it threw down a deposit of 64°; some taken from the retrograde showed a deposit of 98°.

These experiments were repeated on several days with the same results as to proportions, but not as to qualities. During neap tides the convolutions were less, and the quantity of sewerage less. In spring tides there was a greater disturbance, and a greater quantity of sewerage brought back.

Water taken from different parts was now submitted to the test of aberration of light through a 12-inch medium. Water (at high water) taken from the middle of the river, near the surface, gave an obscuration of 4 per cent.; taken at 15 feet below the surface it gave 6½ per cent.; water from half way between the middle and the shore lost 14 per cent.; from within 20 yards of the shore it gave an obscuration of 66 per cent.; water from within three yards of the shore, from a brattice, gave total obscuration.

The supernatant water (the water from which the sewerage had deposited) in all these cases gave nearly the same amount of obscuration as some taken from above Kew Bridge. The colouring matter in river-water generally gives from 4 to 6 per cent. of obscuration through a 12-inch medium.

These experiments were made in August, the month of least water. The narrowest part of the river, or water-way, at low water, opposite the Penitentiary, was 147 yards; its depth in the middle was nine feet, the rate of current 170 feet per minute; taking the mean area of water-way, and making correction for the *vena contracta*, the quantity I found to be 85,000 *cubic feet per minute* running down the river. The quantity on the 29th of October, after rain had set in, was increased to 228,000.

In the river at high water, about the turn of tide, there is a notable period in which the water is still, or nearly so, for about 10 or 20 minutes. The sewerage will then fall at about the rate of a foot per minute; and if it continues for 10 or 20 minutes the sewerage will fall as many feet: at this depth it will reach the bottom in many places. After the tide has turned, and the slow current commenced, the sewerage will still continue to sink in the slack, retrogrades, and eddies along shore, where it will remain until the turn of tide. A large portion on the flow will be stirred up and carried back again by the upcast.

All facts connected with tidal rivers show the greater power of the upcast over the down in convection of deposit. The former estuaries of the Thames, Battersea, Chelsea, and Bermondsey, were formed by alluvial matters first brought down from the hills by the freshet, and deposited in the slacks and eddies low down the river. They could not be deposited on the estuaries directly from the freshet, because the freshet never flowed over them. The alluvial matters deposited low down the river were brought back again by the upcast tide and precipitated on these estuaries at high water.

The greater power of the upcast over the down, in the convection of insoluble deposit in tidal rivers, is strikingly shown in the following case which I will mention, because in almost every condition it is parallel to the Thames, and may be examined at any time without inconvenience. In early life, I lived on the banks of a tidal river (the Camel, in Cornwall). Like the Thames, the tide in this river runs up and down in about the same time, and at about the same rate. The freshet gives an extra downcast over the flow; this river empties itself into the Atlantic about 14 miles below my residence. Along the north coast of Cornwall there is a quantity of sand deposited from the sea, composed of broken *shells*, torn from the rocks; its specific gravity is 2·437; it is greater than that of sewerage, and sinks at the rate of three feet per minute. This sand is brought up from *the mouth of the river* by the upcast tide, against the freshet, and precipitated along its side, 14 miles from the sea, beyond the reach or influence of the breakers. There is no mistake in this matter: no doubt as to the source or origin of the sand. I often watched the convolutions in the tide, turning the sand up and down as it came along the water, on the flow, and noticed their absence on the ebb; I analyzed the sand for agricultural purposes. It is now carried away by carts for manure. I particularly noticed that the quantity of sand carried away out of the retrogrades by carts one day, was deposited again, from the tides, the next. If it was *not carried away* by the carts, the quantity *did not increase*.

The quantity of sewerage retained in the Thames seems also a ruling quantity. The river is never choked up, nor is it ever clean. The quantity of sewerage discharged into the river, like the sand in the Camel, is always in excess; yet the *quantity retained is nearly constant*, governed by the size of the slack and the retrogrades. These cases are parallel: the explanation of the one is the explanation of the other.

I think it right to observe here, that it is evident *sewerage*, like the above sand, if thrown into the Thames, no matter how far down, will be brought *back again* by the upcast; and if the retrogrades are not destroyed,

it will be retained in the river in quantities sufficient to be offensive to the Houses of Parliament; but if the retrogrades are destroyed, it will not be so retained. In the Thames, and all tidal rivers, where there is no room on the sides for *slacks or retrogrades* to form, *there is no deposit.*

In summer, when there is but little river water running down, the tide at Westminster Bridge will stem the current, and begin to flow almost immediately at the period of low water; it will then run up five hours; but in winter, when the river water is large, it often requires from two or three hours before the tide overcomes the freshet head; in such case the time of flow will be minus two to three hours.

In the month of August it usually runs up about five hours; but in the middle of October, after rain, as previously stated, the freshet head at Westminster rose from two to three feet before it gave way; and the tide ran up only three to four hours. I have said that the quantity of river-water running down in August was about 85,000 cubic feet per minute; in October it amounted to 228,000 cubic feet per minute, measured accurately opposite the Penitentiary. Notwithstanding this great increase of downcast, the quantity of sewerage retained in the river at low water was the same. The amount of water did not sensibly affect the amount of sewerage retained. The deposited sewerage, it was evident, must have been well protected against the influence of the downcast; if it had not been so, it would be carried away by the seven (nearly eight) hours' powerful downcast, far beyond the reach of the four hours' upcast. Whether the excess of downcast be as 7 to 5 or 7 to 3, the quantity of insoluble sewerage retained seemed to be the same. These facts are similar to those observed in the above case, and might have been expected.

The sewerage of the Thames, which sinks in the middle of the current, is carried away by the force of the undertow; it is not kept in mixture by convolution, but *ricochets* from point to point along the bottom, until it is carried beyond the force of the current, or settles down in a vertical retrograde, generally not far from the outlet. It may be observed that the foregoing observations have been confined to horizontal retrogrades; the vertical ones along the bottom have not been noticed, because there are few above Westminster Bridge that require correction, and there has been no time to fairly examine those below.

The deposit on the sides of the river above low water mark is now mostly washed down by the wave of the steam-boats into the slacks and retrogrades lying below the line of junction—between low water mark and the shore—where it is retained, as previously shown. From Battersea Bridge to Greenwich there is little deposit to be seen, except about the Houses of Parliament, Temple and Whitehall Gardens. From the Penitentiary to Hungerford is the most filthy part of the river, mainly occasioned by two retrogrades, one outside the Libraries and Speaker's official residence, the other at Hungerford.

The liquid and *soluble* parts of sewerage become mixed directly with the water as it flows into the river from the sewers, and, as soluble sewerage does not precipitate, is carried away by excess of the downcast; some part, however, hangs about in the cesspools, particularly that discharged at or near low water, for at this period the sewers mostly discharge themselves, and the eddies along shore set upwards. There has not been sufficient time for me to ascertain accurately the rate of solution of solid sewerage after continued maceration in the river. It will be near enough for the present purpose to state generally that, judging from the experiments I have made, about one-fifth will be dissolved after a week's maceration; the exact quantity, whatever it may be, will not in principle or practice affect the question before us.

There are many facts confirming the foregoing views with which I need not trouble you. It will be manifest on consideration of those detailed that the pollution of the Thames is occasioned by *precipitation of sewerage in the retrogrades* and *brattice cesspools* in the river; that in them the filth is retained, instead of being carried away by the downcast tide. The means of relieving the Thames of its present burthen of filth is manifest.

In a letter of the 3rd of August last, which I had the honour to address to you on this subject, I stated that mechanical drawings were necessary to explain the arrangements which I contemplated. To which letter you replied, 25th of August (3891), that the board had no funds from whence they could defray the expense attending the making of these drawings. I am sorry that, in consequence, I cannot explain my views as clearly as I could wish. I fear they may be misunderstood.

I recommend—That all the retrogrades and brattice cesspools be destroyed.

That all obstructions to a uniform flow of the river at low water be removed.

That the projections along shore be rounded off, and the hollows filled up.

That the serrated edges of the river at low water be made plain, and continued along the whole line of low water mark.

That the width of the water-way, when the tide is at its lowest ebb, be not more than 140 yards from side to side, so that the river may run, not only in a uniform current, but at a rate of not less than 225 feet per minute.

That from low water mark upwards the beach be so constructed that the shore may rise at about an angle of 3° to 4° with the horizon; or, in road-making language, of not less than 1 in 16, to facilitate the fall of the sewerage into the bed of the river.

The cost of this arrangement will not be so great as would appear at first sight. A large portion of the material is at hand, and has only to be removed from the higher to the lower levels. Any additional quantity may be obtained at 1s. 6d. per yard, delivered on the spot. Thames gravel, properly arranged, would not be disturbed by the strongest freshet. The navigation of the river would be improved.

In very dry weather in summer, if the current within the prescribed limit should require assistance, it may be obtained by flushing, the water for which may be taken from the tide, at high water, into Battersea Park or some other more convenient place. I do not think, however, this would be necessary.

Gaseous sewerage remains to be considered. Noxious gases are rapidly formed in the sewers by the decomposition of putrid and other matters; and, as there is no ventilation or means provided for withdrawing them, they escape, under the laws of diffusion of gases, into the streets and houses wherever there happens to be an opening. The sewers are the same in every respect now as they were before water-closets were in use; no change has been made to meet the altered requirements. The sewerage gases are discharged in large quantities from the open mouths of the sewers along the sides of the river, seriously affecting the atmosphere of the Houses of Parliament.

Gaseous sewerage is a deadly poison, and many valuable lives have been lost by inhaling it in this country and abroad. They are recorded as having occurred in Paris, Brussels, and other continental towns. In London, also, many deaths have been occasioned by breathing gaseous sewerage. I have witnessed several cases of death, and others in which men were taken out insensible after only a few seconds' exposure. In Warwick Street, Pimlico, five men were killed in 1852 by gaseous sewerage. I was requested to examine this case, and gave a long evidence at the inquest. Three of these poor fellows had gone into a sewer early in the morning, and not returning in time for breakfast an alarm was felt for their safety. A surgeon, anxious to render assistance, entered the sewer and was killed on the spot. A young policeman followed to assist, and was also struck dead in a few seconds. On examination after death there was evidence sufficient to show me that he could not have made more than two inspirations before death after entering the sewer. There were only two charges of blood from the lungs discoloured by sulphuretted hydrogen.

On making an opening downwards from the street into the sewer, to get these poor fellows out, the gases as they escaped were set on fire by a match; they burnt with a yellow flame, rising 20 feet high. Within the last few months three lives have been lost in the nighbourhood of Whitechapel; the men were killed by breathing sewerage gas as it escaped from an opening made into another sewer. Many are the deaths known to be produced by breathing gaseous sewerage; and, if chemistry was insufficient to point out its deadly character, these cases furnish sufficient evidence. Whether sewerage gases kill suddenly or not is a question of degree. In small quantities they are very injurious to health. It is stated that a horse made to breathe an atmosphere charged with 1 in 100 of sulphuretted hydrogen would die in 30 hours.

I have stated elsewhere that the atmosphere of the Houses of Parliament is impregnated with sewerage gases mostly escaping from the open mouths of the sewers in the neighbourhood alongside of the river. For a long time offensive smells were complained of in the courts of law at Westminster, and on one occasion the judges were driven from their benches by a sudden outbreak of stench, which also reached the Houses of Parliament. I was requested to examine into the matter, and found the stench escaping from the open mouth of a sewer at this end of Westminster Bride—Bridge Street sewer. I recommended the mouth of the sewer to be trapped, so as to allow the solid and liquid sewerage to escape, but not the gaseous. This was done, and no further complaints were heard, either in the courts of law or the Houses of Parliament, until within a fortnight before the end of last session (five years), when the stench suddenly returned. On examination it was found (as stated by you in answer to a question in the House) that the trapping of the mouth of Bridge Street sewer had been suddenly washed away by the breaking in of the Victoria sewer in Whitehall Yard; this was the cause of the sudden outbreak. I mention these facts because they show the importance of trapping, and support the proposition I have already made in a former report—that the mouths of all sewers alongside the river should be trapped.

In this communication I alluded to the probability of a fear being felt that the gaseous sewerage being prevented by trapping from escaping at the mouths of the sewers would be driven back into the streets. This fear is groundless: gaseous sewerage does not escape from accumulating pressure, but under the direct action of the laws of the diffusion of gases. The interchange is under a specific chemical law, not a mechanical one.

Supposing it possible that the rate of diffusion or interchange would be reduced by closing the openings of the mouth of the sewers, so that they would become charged with greater intensity, and thus prevent workmen from entering? This inconvenience might be prevented by having a special opening made in some convenient place near the mouth of the trapping. From this opening the foul gases might be withdrawn and destroyed *in situ*, or more correctly speaking decomposed, *and reformed into inoffensive combinations.*

Doubts may arise as to whether this can be done, more particularly since the trials hitherto made from time to time are known to have failed.

From time immemorial the practice of purification of putrid matters has been by fire, and naturally this process was tried for purifying the putrid gases of cesspools and sewers; the experiments all failed; the elements of gaseous sewerage resisted this mode of treatment. At Brussels the sewerage gases were attempted to be burnt by passing them through a large furnace fire; they resisted it, and fell from the top of the chimney unburnt, making the neighbourhood worse than before*.

Many experiments have been made in London with no better success.

The failures in these cases were not in principle, but in practice. The interference of the great mass of atmospheric air over that of the sewerage gases had not been calculated on. To those acquainted with pneumatic chemistry, and who have more particularly studied the laws of combustion, the reason of failure will be apparent. As this is an important question connected with the success of any plan for preventing a further pollution of the atmosphere of the Houses of Parliament, or, indeed, generally in London, it will be desirable to go further into its consideration.

Sewerage gases are inflammable; they will burn, like street gas, silently from a jet, when unadulterated, and explode when in mixture with common air in certain proportions. The gaseous sewerage burnt with a high flame when set on fire at Pimlico, and exploded in a sewer at Friar Street in the Borough. Under certain circumstances, it will neither inflame nor burn, even when passed through a furnace fire; yet, under others, it will explode at a naked candle. All these seeming contradictions are occasioned by a mixture of more or less quantity of atmospheric air. It is an essential condition, under the laws of combustion, that all the elements involved, whether gaseous or otherwise, be brought up to a certain temperature for ignition before they will burn. It is shown by experiment that a mixture of carburetted hydrogen with atmospheric air, requires 600°†. Now, to bring up the temperature of the large mass of atmospheric air, mixed with sewerage gases in the sewers to this point of ignition, is very difficult. During the period which it takes in passing through an ordinary furnace, it is impracticable; and hence the failure of the experiments. A different apparatus, to meet the conditions, must be constructed before there is any chance of success.

If an ordinary furnace be used, the sewerage mixture must be exposed longer to the direct influence of the fire by some efficient modification; or the affinities of the effluvia must be weakened, or broken down, by mixing with them some simple agent which will occasion ignition at a lower temperature—acting like a flux in the reduction of metals. The most simple arrangement probably is that now in use in the Houses of Parliament. It was constructed for the purpose of burning any sewerage gases which might be pent back by trapping the mouth of Bridge Street sewer, above spoken of. I need not describe this apparatus; it is well known to you, and may be seen by any one in action. It has been in successful use for the last four years, and affords a practical demonstration of a mode by which noxious sewerage may be burnt when escaping from the sewers along the river, or any other place.

The offensive vapours escaping from some of the manufactories on the opposite side of the river must be prevented.

If the retrogrades be destroyed, the mouths of the sewers trapped, and the sewerage gases burnt, all cause of complaint of the atmosphere about the Houses of Parliament would cease. A question would probably arise as to whether any drainage of London beyond the natural outcast power of the river would ever be required. I have the honour to be, &c.,

GOLDSWORTHY GURNEY.

* See Monsieur Pecelet's Report.

† See my work on the Elements of Chemical Science.

P. S.—It will be evident that placing tidal valves at Westminster Bridge, to keep down the upcast sewerage, would relieve the river. So also, if the freshet head of Putney were brought down to Westminster, the same end would be effected. To detail these arrangements more data for calculation than I possess would be necessary, and drawings and surveys indispensable. I have therefore not referred to them in this report. At the same time I wish to mention them here, lest I may be supposed to have overlooked means so self-evident. The above recommendations do not interfere with any vested interests, or affect the navigation of the river, and therefore may be carried out at once.

Death of Mr. John Evans.—This gentleman, for many years the superintendent of the Chartered Gas Company's Works, Horseferry Road, Westminster, expired at his residence, Warwick Terrace, Pimlico, on the 14th instant, in the 72nd year of his age. Mr. Evans retired some years since from the service of the company, with which he had been connected almost from its commencement, carrying with him into private life the respect and esteem of every one with whom he had transactions during his long official career, and solaced in his declining days by the unremitting attentions of a devoted and affectionate family. Under his direction the Westminster station, which is, as it were, the cradle of the art of gas lighting, grew to the colossal proportions which have rendered it an object of interest to all connected with the profession, and have, since his retirement, been so ably augmented by his son and successor, Mr. Frederick J. Evans.

Portmadoc Gas-Works.—Port and Tremadoc have recently been lighted with gas, and the completion of the works was celebrated by a public dinner at the Town-Hall, Portmadoc, on 29th ult. The undertaking, which was under the superintendence of Mr. George Walcott, gas engineer, has been most satisfactorily completed, the contract for the iron-work being entrusted to Messrs. Thomas and De Winton, of Carnarvon, and that for the buildings, &c., to Messrs. Morton and Williams, of Portmadoc.

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To secure the advantage of this year's entry, proposals must be lodged at the Head Office, or at any of the Society's Agencies, on or before March 1.

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Manufacturers of Wet and Dry Gas Meters, Station Meters, Governors, Experimental Apparatus, Lanterns, &c. &c.

Contractors for the erection or alteration of Gas-Works; and every description of Apparatus required in Gas-Works supplied.

PIRNIE CANNEL.—The Proprietors of the PIRNIE COAL COMPANY are now prepared to ship their excellent Gas Coal in the Frith of Forth, or put it on the East Fife Railway. It contains but little sulphur, and yields over 10,000 feet of 26 candle gas per ton. For particulars apply to Mr. Robert Carrick, Manager, Pirnie Colliery, Leven, Fife.

NOTICE.—Mr. N. DEFRIES, Consulting Gas Engineer, begs to inform gas companies and the public, that he is desirous of meeting any gentlemen at his WORKS, NEW ROAD, ST. PANCRAS, where, under his own superindence of the manufacturing department, they will have the fullest opportunity of investigating the many improvements he has recently effected in his ROTARY-VALVE DRY GAS-METER, by which full security will be afforded against leakage and non-registration, even against the searching effects of Cannel Coal Gas. The Rotary-Valve Meter is warranted to register inflexibly correct at a working pressure of half a tenth, and less than a quarter of a foot per hour upon a blue light; and a guarantee will be given to all gas companies to keep it in repair for not less than five years, free of expense. With this meter the gas-supplier may fully depend upon a fair return, and the public upon having a just measure.

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Any communications addressed to him as above shal have prompt attention.

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Originally established in 1833,

Manufacturer of Gas and other Tubes, Fittings, and articles of every description belonging to Gas, Water, or Steam.

E. D. had the honour of receiving the

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warded to this Manufacture by the COUNCIL of the GREAT ENGLISH EXHIBITION of 1851; and from the latter date has supplied many towns exclusively with GALVANIZED and other Tubes for Gas and Water, under GOVERNMENT ENGINEERS.

A City, containing 150,000 inhabitants,

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HYDRAULIC PRESS TUBES,

to resist 6000 lbs. and upwards to the square inch, extensively manufactured.

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Every Tube carefully tested with Hydraulic Pressure before leaving the Works.

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MR. LAMING (Inventor of the Revivified Oxide of Iron Purification) has the satisfaction to announce that Gas may now be purified in a manner that combines unusual commercial advantages with all the possible requirements of the sanitary officer and the public. All that need be said to call attention to the new process is, that instead of the purifying-house, two vessels of small area, placed after the condenser, suffice; that these vessels never have the least communication with the atmosphere; and that neither lime, oxide, nor any other substance foreign to the gas itself is brought into contact with it. Gas engineers will perceive among the advantages thus offered, economy in room, labour, and materials; impossibility of nuisance; and total absence of injury to the illuminating power.

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These Meters are as simple and durable as the Gas-Meter, and as correct as that instrument in the registration of the fluids passing through them.

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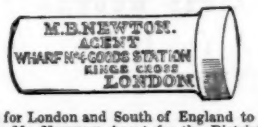

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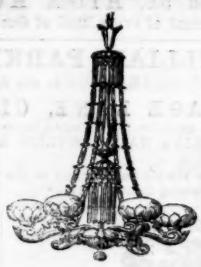

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